February 13, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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FEB 13 1950

the WEAN
ENGINEERING COMPANY INC.
WARREN, OHIO

To better serve the requirements of the trade and to operate at a profit in a highly competitive field, steel plant executives recognize they must have the most modern and efficient equipment available.

The Wean Engineering Company, Inc., Warren, Ohio, is the recognized leader in the design and installation of sheet, tin and strip mill equipment, whether it be one piece or a complete unit.

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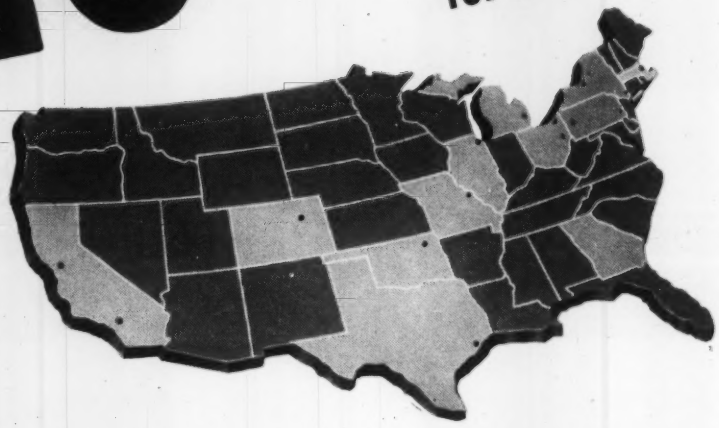

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In addition to B&W Tube Co. offices listed here, jobbers and distributors stock B&W Tubular Products . . . grades, sizes and gauges for all pressure and mechanical needs. Write for name of distributor nearest you.

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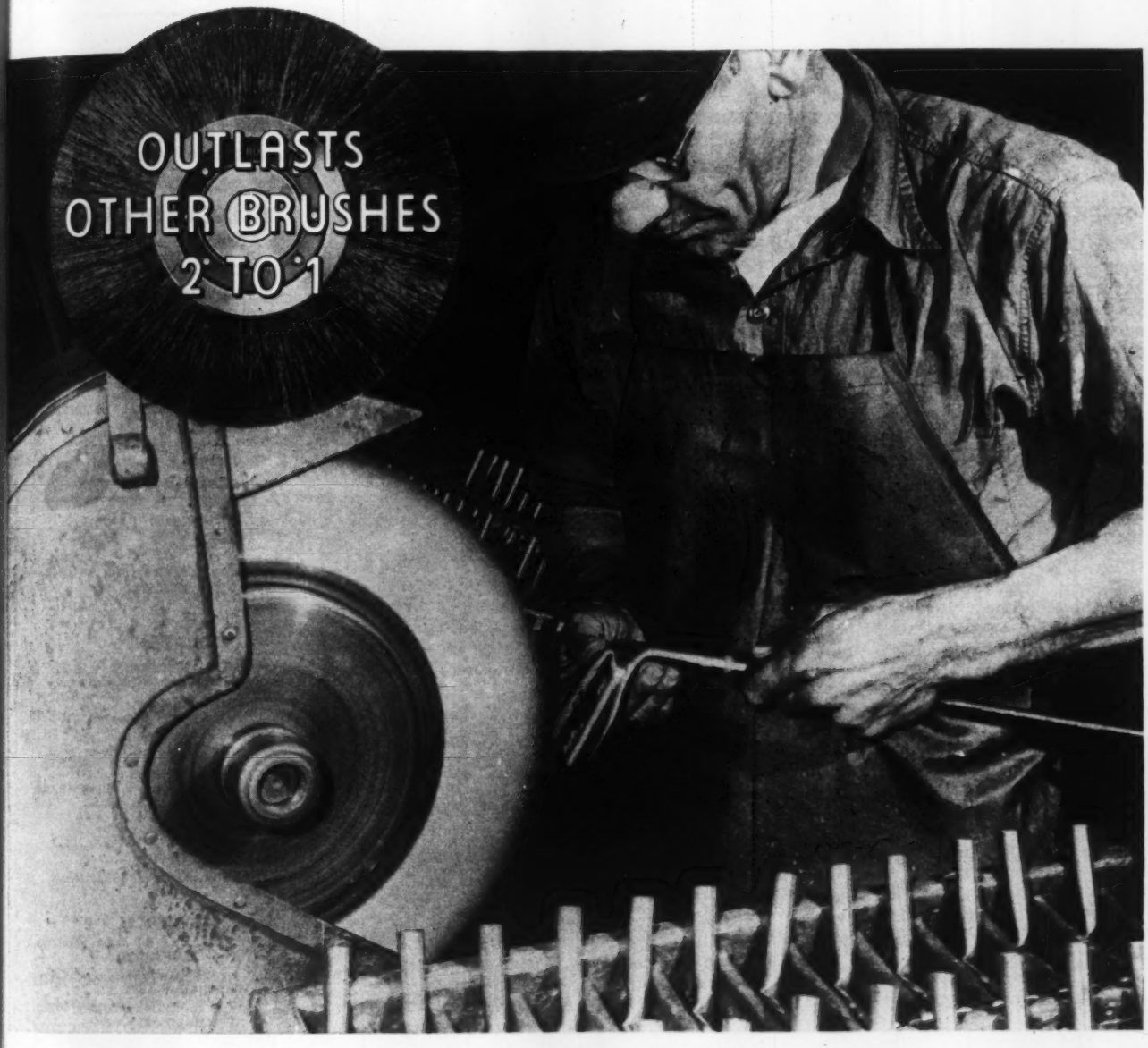

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• Whether brushing stainless steel to a lustrous satin-like finish or brushing carbon steel to refine its polish prior to plating, Osborn MONARCH® Power Driven Brushes perform the job easier, faster and at a lower cost. In the application pictured above, Osborn MONARCH® Brushes *outlast all others 2 to 1.* This longer brush life is the result of the Osborn Ringlock construction, which prevents shedding, assures balance and a full, even working face required in an efficient brushing tool.

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Behind the Scenes...

Psychic

The head of an engineering department—let's call him Smith—was having trouble with one of his young draftsmen. His work was fair, but he was addicted to horseplay around the drawing boards, two-hour lunch periods and dalliance with the receptionist in the lobby. The last straw came when the draftsman was "sick" for the second time in a week and didn't show up one Friday. Exasperated, Smith phoned in a help-wanted ad to the local paper. The notice listed requirements for the job and gave as an address an anonymous box number.

The ad ran Saturday and Sunday. On Monday Smith picked up the responses first thing in the morning. One application was from the man he wanted to replace.

It's Still Good

Ever sold a product 15 years old? That's a good age for whiskey, but for what else? Associate Editor Vance Bell has one answer. He's just sold a copy of our 1935 Yearbook issue to Republic Steel Corp. Republic lost its file copy and checked with Vance who calls on the company a good deal. Our circulation people dug into their archives and found one that could be sold; we keep a minimum of two for file.

While we're discussing yearbooks, we'd like to point out that the boys upstairs were off only by two days' output in their estimate of 1949 pig iron production. In the 1950 yearbook issue, they placed it at 54 million net tons. American Iron & Steel Institute some weeks later officially set it at 53,613,719 tons.

Emily Post, Where Are You?

We've just heard about an awkward social situation that would tax Emily Post herself. A salesman thought his January expense account check was pretty slow in coming so he went over to the accounting department to locate the trouble. He was a little angry—a little less on his toes than usual—and barged into the office of an acquaintance in the department. He was halfway into the office before he saw that the accountant friend was on the telephone. He heard these unmistakable words: "Darling, I love you."

The salesman tried a hasty exit, but too late. The accountant dropped the phone like a hot rivet. Their interview was rather strained, and the salesman doesn't have the expense account matter straightened out yet.

Ad Cruising

In a sneak look at a few of the ads that appear in this issue, we were impressed by the fact that the editors aren't the only ones with information to pass along to you. Do you know, for example, how the brass industry was started in the U. S.? Bristol Brass Corp. tells some of the story in its spread on pp. 24-25. Do you know how to save eyesight, literally? American Optical Co.'s ad on page 40 tells you how it can be done with safety goggles. Costs of industrial eye accidents have gone up 78½ per cent since 1939.

Puzzle Corner

The puzzle of Jan. 30 brought in four answers up to the time we went to press, but only one was right. E. J. Sampson of Brockton, Mass., says the car is one year old and the tires nine months old. He's correct.

The bolt puzzle of Jan. 9 is still bringing in answers. Clarence H. Brown of Goodman Mfg. Co. points out that we didn't tell the whole story when we answered the problem Jan. 23. There are infinite answers: 301, 721 (as we reported), 1561, 2401, 3241, etc.

The same sweeper who had difficulty with the bolts is involved in another problem. A double-track trolley line runs between two stations which are 6 miles apart. From each station cars set out for the other station every 7½ minutes and proceed at uniform speed. The sweeper leaves one station just as one car is arriving and another leaving. He walks beside the right of way at constant speed until he reaches the other station just as one car is arriving and another leaving. Including these four, he saw 62 cars on his way, 19 going in the same direction as he and 43 going in the opposite direction. What was his speed, and what was the speed of the cars?

Shrdlu

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STEEL

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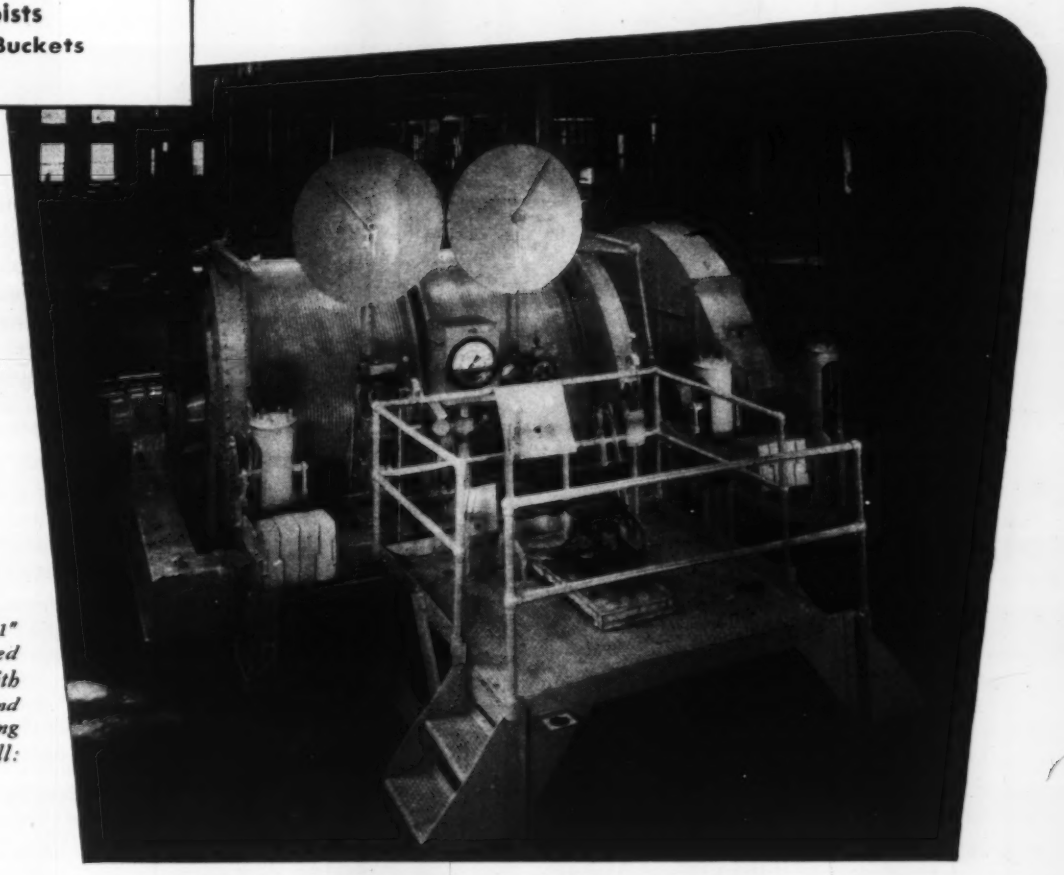


Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' x 13' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

● For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our 50 years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactorily.

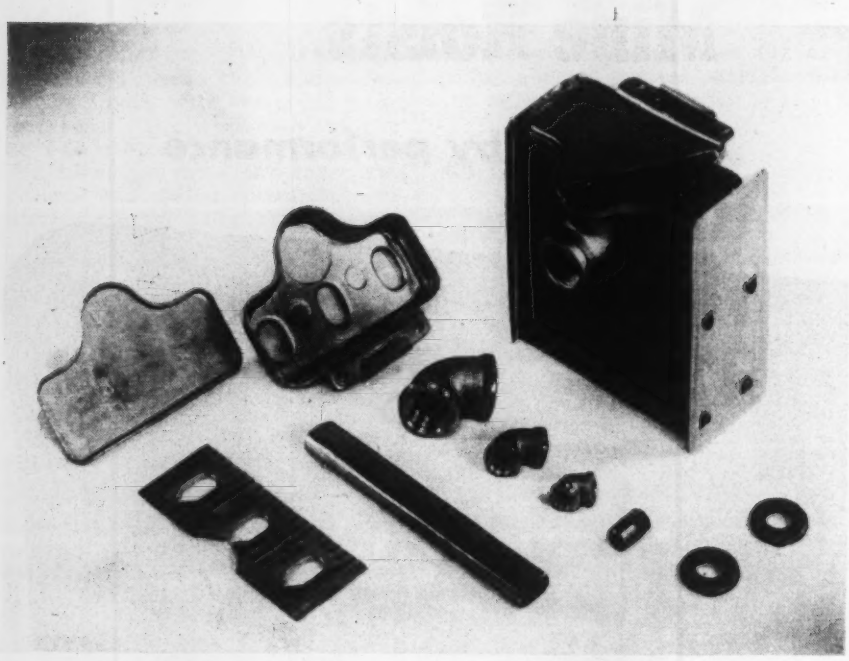
THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*



Cutaway section of convector element and component parts — courtesy Tuttle & Bailey Inc., New Britain, Conn.

Size of Convection Heaters Reduced by Using Copper

The ability to conduct heat at a rapid rate and to withstand corrosive attack has made copper an integral part of convection-type heating systems. Cool air comes in contact with the heating unit, rises when heated and sets up convection currents which perpetuates this cycle.

For the highest efficiency it is necessary to have a large area of heated surface. This is accomplished by extending the heating surface of the tubes by attaching thin sheets of copper to the tubing carrying the heating medium—hot water or steam.

High Heat Transfer

The heat in the tubing is speedily transmitted to the entire area of the fins which heat the air by contact. It is here that the high conductivity of copper comes into play. Despite the cold air coming into contact with the fins, they remain at practically the same temperature as the tubing carrying the hot water or steam.

The unit manufactured by Tuttle & Bailey Inc., New Britain, Conn., has oval copper tubing. The two heads which form the inlet and outlet ends of the radiator are fabricated from copper sheet. The inlet and outlet connectors are brass castings; however, they merely carry the heating medium to and from the element.

By using copper for the tubing and heads, high heat transfer characteristics are assured through the minimizing of corrosion. Any corrosive film acts as an insulator between the water or steam and the conducting metal, thereby reducing the flow of heat through the metal to the fins.

Soldering Fins Simplified

A clever method of attaching the fins to the three tubes in the heater shown was devised. The fin sheets are dropped between steel plates in a jig with the proper spacing. Steel points are inserted into the front ends of the tubes. Then solder wire is put into holes in the points and the tubes are hand started into the first plate. An air cylinder then forces the tubes through the plates and the solder is pulled through by the tubes. A space for the solder wire is allowed for when the holes in the fins are drifted in the press operation.

The solder is then melted by a special method of electrical heating. While the next one is being soldered, the operator washes the flux from the previous unit by dipping.

Not only is greater rigidity obtained by soldering but a metal-to-metal bond between fins and tubes is assured. The fins are strengthened by corrugation which also increases surface area for improved radiation.

Stampings Used for Heads

The heads are fabricated in two pieces. One part is a drawn shell and has the holes pierced and drifted to take the tubes and the connector. A second part is the end plate which fits into the drawn shell. The high ductility of the copper makes the drawing and forming operations relatively simple.

Phosphor copper brazing rod is used to join the connectors and tubes to the head as well as sealing the end plate.

Many such installations are built into walls, especially if put in while the house is being built. Standing units are also used. The long life of the copper eliminates costly maintenance which would be entailed if another metal of less corrosion resistance were used.

Small Units Possible

Small units are possible by fabricating end heads to replace bulky castings. At the same time, the high conductivity of copper also permits less bulky units with greater efficiency than is possible with other materials.

Where multiple operations are performed on sheet metal, Bridgeport's Laboratory is prepared to lend a helping hand to the designer in selecting not only the correct alloy, but the temper best suited for the job.

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CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, research chemist of the Bridgeport Brass Company.

PREVENTION OF CORROSION IN STORAGE

Protecting Precision Parts

(Continued)

For long time storage of precision or other types of copper or copper alloy parts protective coatings are frequently used. With solvent type coatings the purity and inertness of the solvent and the stability of the corrosion inhibiting compound are of the utmost importance.

It has been reported that effective corrosion inhibiting compounds have actually accelerated the corrosion of copper and copper alloys when deposited on their surfaces from chlorinated solvents.

Some protection can be obtained by petroleum base oils with or without corrosion inhibitors. The protection given, however, is limited and cannot be depended on for prolonged storage or under adverse conditions. Residues of vegetable or animal oils either straight virgin oils or compounded with petroleum products used as lubricants during various manufacturing processes should be avoided. These oils change to fatty acids (oleic acid, etc.) which attack copper or copper alloys with the formation of bright green colored copper soaps (copper oleate, etc.). Therefore, when it is necessary to use lubricants of this type, the metal should be carefully degreased if processing delays or prolonged storage are anticipated.

Non-Tarnishing Wrapping

Most wrapping papers contain sufficient sulfur to tarnish or spot (black colored) copper and high copper alloys. Paper used to wrap clean copper and high copper alloys should be of sulfur-free, non-tarnishing quality. Extremely low sulfur papers are available for wrapping copper, brass or silver. As a further precaution, clear lacquers and plastics are widely used to prevent tarnishing of copper and copper alloy parts during storage. Colored lacquers are only used when a colored product is desired.

Aluminum foil wrappings for precision parts, instruments, etc., are particularly promising for long time storage since the packages remain vapor tight for indefinitely long periods of time.

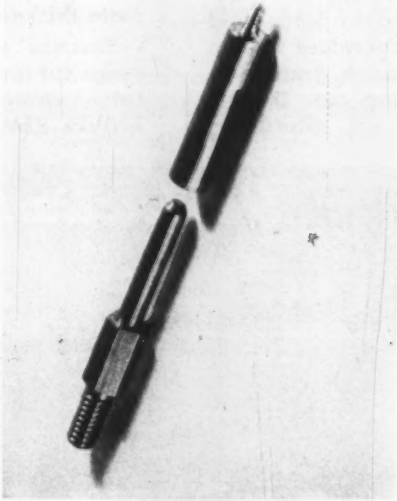
Rubber adhesives and bands should be avoided in the packaging of copper and copper alloys since they contain sufficient sulfur to blacken the surface.

A Better Jack Plug ...from Duronze III

Credit it to the after effects of our previous all-out efforts in mechanical warfare. The fact remains that design and mechanical engineers are giving closer scrutiny to their metal specifications. As a result, they are obtaining better performance from many long established products by turning to stronger, harder, and more corrosion resisting alloys for making "key" parts that are subjected to deterioration or excessive wear.

The jack plug shown below was made from Duronze III (Silicon Aluminum Bronze), which contains about 91% copper, 7% aluminum, and 2% silicon. In the annealed condition this alloy has a tensile strength of about 90,000 psi and a Rockwell hardness of B85. Consequently, it is a stronger and harder alloy than brass rod. This explains in part its exceptional resistance to wear from abrasion.

Duronze III rod is greenish yellow in color and is lighter in weight than brass. It has a machinability rating in the neighborhood of 60% as compared to 100% for free turning brass rod. With proper surface speeds and tool grinding plus an adequate coolant-lubricant, high quality screw machine parts are readily obtained. Write for the Duronze Manual for suggestions for improving products through better materials.



Jack Plug machined from Duronze III Rod—Courtesy: Atlantic Manufacturing Company, Milford, Conn.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items have been tested or are endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Planetary Speed Reducer for application on a portable drill increases torque on the output side by 5 to 1 to drive a bit considerably larger than the rated capacity of the drill. Applications include screw driving, nut running, reaming and honing in addition to drilling. **No. 1023**

Magnetic Micrometer is said to measure dry film thickness of paint, plating or enamel on a magnetic or non-magnetic base. It is used in connection with a thickness scale that has been graduated in a given thickness range for certain film materials on certain bases. **No. 1024**

Combination Metalworking Machine designed for shops which have quantity of punching and shearing work, is equipped to punch, shear, cut tees and angles, to square or miter round and square bars, shear ½" plate, and to cope and notch I-beams or channels. **No. 1025**

New Spray Equipment provides a timed shot of oil mist to lubricate the wearing surfaces of tools in a press. Pump and valve are actuated by the press ram so that the timed jet of oil mist will be directed at the tool surfaces at the proper instant. **No. 1026**

A New System is announced for screw-thread measuring. Used with standard micrometers, the only other tool needed to measure all sizes and pitches of 60 degree threads consists of one connected pair of hardened and precision-ground triangular steel bars with points truncated to clear the thread roots. By the use of a simple chart of constants, only one number need be added to the nominal outside diameter of the thread to determine the correct micrometer measurement for a thread of any given diameter and pitch. **No. 1027**

Shearing Die Attachment converts punch press into 10-gage, 48-in. power shear in about 15 minutes, it is claimed. Attachment is equipped with adjustable front and back gages and hold-downs of one-piece stripper type spring-loaded construction. **No. 1028**

Electronic Metal Tracer is said to make it possible to locate defective points in wire, cable, metal pipe or any other conductor. Equipment produces signal which follows wire or other conductor that may be imbedded in wall, buried underground or lost in a maze of other conductors. **No. 1029**

Portable Hack Saw Attachment is designed to be powered by standard ¼" electric drill. Using 10-in. blade, saw has 5-in. stroke and delivers 200 strokes per minute when speed of drill is 1240 rpm. **No. 1030**

New Tube Flaring Tool which both flares and burnishes copper, brass and aluminum tubing, has been announced. Tubing, instead of being flared against a flaring block, is flared above the face of the holding block, maintaining original wall thickness at the point of flare. A simple adjustment after flaring permits burnishing. Operation is manual. **No. 1031**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

"Bridgeport" BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

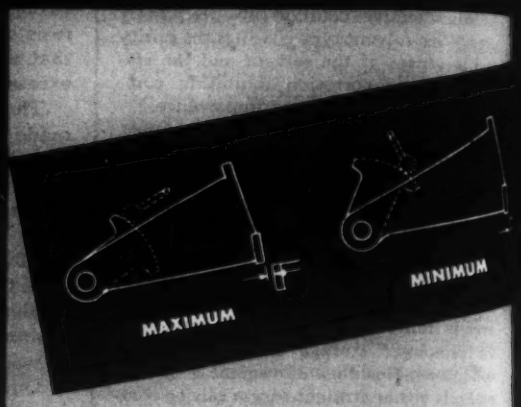
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

Advertisement

MICRO-SPEED

acclaimed



KNIVES REMAIN SHARPER LONGER BECAUSE OF MICRO-SPEED

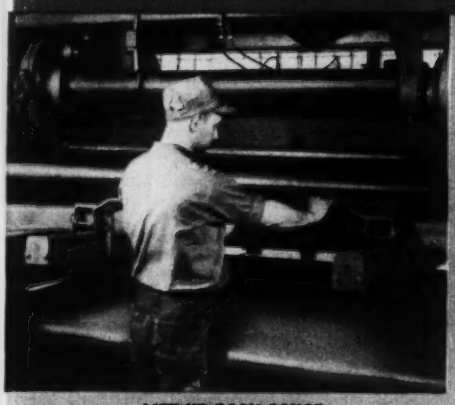
From coast to coast Steelweld Shear users are acclaiming Steelweld's MICRO-SPEED knife adjustment. There's nothing like it available on any other shear—at any price. It's the greatest development in shear design made in decades.

As every shear user knows, there is a direct relation between the thickness of plate cut and the clearance between knives for most satisfactory results. But heretofore, because of tedious time-consuming work required to change knife clearance, most shear operators seldom adjusted the clearance unless there was a great variation in the thickness of plates being cut. Despite the advantages resulting, they could not afford the time required to adjust the knives to proper clearance.

Steelweld's MICRO-SPEED makes knife adjustment fast and easy. Merely turn a crank and watch a dial. That's all there is to it. In a jiffy the indicator is on the proper figure and the machine is ready to go. No bolts to loosen! No bed to move! No feeler gauges required! The large easily-read dial indicates the clearance between knives in thousandths of an inch and also shows the plate thickness that may be cut with any knife setting.

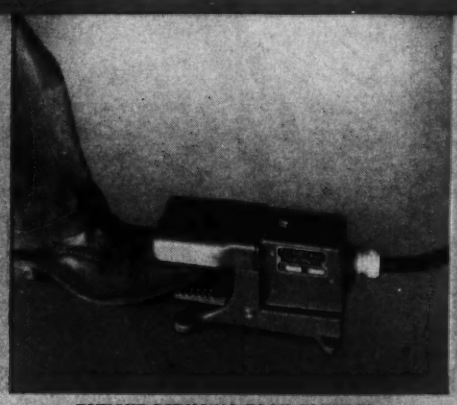
Because of simple MICRO-SPEED knife adjustment every cut made on Steelweld Shears is the best possible cut — straight, smooth, accurate. And of importance KNIVES REMAIN SHARPER, LONGER.

A FEW OF MANY OTHER *Production Speeding* FEATURES



LIFT-UP BACK GAUGE

Lift-up back gauge can be raised out of way to allow long sheets to pass through by easy movement of horizontal bar. No time need be spent detaching or removing back gauge. Standard feature on ⅜ inch capacity shears and larger.



FATIGUE-REDUCING FOOT CONTROL

Convenient electric foot-switch operation is standard for all Steelweld Pivoted-Blade Shears. The switch can be moved around floor to wherever handiest. Eliminates tiresome leg lifting ordinarily required.

STEP-SAVING GAUGE ADJUSTMENT

Steelweld design eliminates need of many [illegible] around machine to adjust hand-operated [illegible] gauge at rear. Adjustment crank is [illegible] reached at right end near front. When [illegible] power-driven gauges can be furnished.

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Boosting Pipe Galvanizing 30% With Revamped Facilities

New Honing Method Improves Gear Surface Finish

Production of High Alloy Steel Castings—II

By-Product Coke Oven Yield Controlled by Measured Load

STEEL

The Magazine of Metalworking and Metalproducing

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February 13, 1950

Ignores Basic Problem

Following months of futile shadow-boxing by everybody involved in the coal strike, the nation last week found itself on the brink of another crisis. Unless mining is resumed this week the scarcity of coal will cause serious cutbacks in many lines of activity.

Probably, as on many previous occasions, last minute action will bring about some sort of a truce. Coal again will become available and everything will go along peaceably for a brief period, after which the nation will be confronted with another coal crisis. The trouble is that none of the settlements of coal disputes in recent years has considered the basic problems of coal. Each settlement has been simply a stopgap operation improvised solely for the purpose of solving a current grievance.

A cursory examination of coal mine statistics shows that frequently recurring coal crises will continue to confront the nation until something is done to cure the ills which beset the industry. Among these ills are over-capacity of mines and excessive number of coal miners.

In the middle twenties about 750,000 American coal miners were producing about 600,000,000 tons of coal a year. In 1944, the peak year of coal output during the war, 450,000 miners got out 685,000,000 tons of coal. In 1949, when at least 120 working days were lost by strikes, about 400,000 miners turned out slightly more than 400,000,000 tons, which was sufficient to supply the domestic and export market.

It is clear that the efforts to maintain high wages and liberal pension and welfare benefits for an excessive number of miners has had the effect of pricing coal out of some of its most attractive markets. One wonders if the coal operators, coal miners and the public would not be better off today if the efforts of the past decade had been directed more effectively toward adjusting mine facilities and mine employment more realistically to consumer demand.

American history affords numerous illustrations of industries which have adjusted their affairs to changing conditions without subjecting the nation's economy to a serious crisis every few months. It is not too much to ask the coal industry to engage in a long-range program to put its house in order.

* * *

EXTRA REVISIONS DUE: Now that many steel producers have issued new extra cards, it is possible for consumers to make detailed comparisons. A careful examination shows a high degree of uniformity among the extras issued by most companies.

This uniformity does not make sense in light of the reasons given for revising the extras. When United States Steel announced its drastic revision of extras a month and a half ago, it explained that the purpose was to adjust extra charges so that they would conform more closely to the present-day actual cost of providing the special qualities, finishes, tolerances, sizes and services for which extras are charged. The revisions were supposed to bring extras more in line with today's manufacturing methods and costs.

Obviously there are striking differences between the operations of individual mills and of companies. A producer whose mills are chiefly geared to narrow or medium width strip or sheet certainly has costs for extras that are radically different from those of a producer whose mills specialize on maximum widths. Notwithstanding this glaring discrepancy, today the extra

(OVER)

cards of the two companies are almost identical.

Such unrealistic uniformity probably will not continue long. Competition for the buyer's orders will be intensified during the next few months. Buyers can almost take it for granted that there will be numerous refinements in extras, all calculated to relate extra charges to the actual conditions affecting each producer.

—p. 56

* * *

HUMAN ELEMENT HELPS: In an unusual article on the use of special machinery as a means of increasing production, the author places heavy emphasis upon the human element in the environment in which the machine is designed, developed, put into use, operated and maintained. He contends that no matter how soundly the machine is designed or how carefully it has been constructed, it cannot be used successfully unless certain human qualities are present.

First, top management must be optimistic and patient in its attitude toward the machine. Secondly, competent help for the proper maintenance of the unit must be available. Thirdly, production supervisors must be in on the ground floor from the time the machine is first planned so that their co-operation in gearing it into the production scheme will be assured. Finally, the men who are to operate the machine must be carefully trained and supervised. With these precautions as to the human element, a good machine has a chance to yield handsome dividends.

—p. 84

* * *

EUROPE AWAITS FEB. 23: Apparently the outcome of the British elections on Feb. 23 will have repercussions in most of the industrial nations of Western Europe. If by any chance the Conservatives should regain control of the government, certain alignments among European states might be altered.

For instance, economic planning for Western Germany is at a standstill. Right now Britain and German labor favor a mildly socialist state while Americans and German management favor private enterprise. A Conservative government in Britain might swing the balance toward the American viewpoint.

Belgium-Luxemburg has been uncomfortable in its strange role as the sole free enterprise state in Western Europe. It would receive a psychological stimulus from a shift to the right in Britain. Public ownership proposals for steel and other industries in France would gain new impetus if the British Labor party wins and probably would be sidetracked if the Conservatives come into power.

—p. 63

* * *

BUILDINGS FOR JAPAN: Plans for an ambitious and rather unusual project for Japan have been announced by Wurdeman & Becket, architectural engineers, Los Angeles. The program, to be financed by private capital by Japanese and American interests, calls for a series of hotels and trade and cultural centers designed to restore profitable tourist trade to Nippon.

First unit is to be a 1000-room hotel on the outer grounds of the Imperial Palace in Tokyo. This would be the largest hotel in the Orient. Other structures will be office buildings, a department store, two theaters and other structures in Tokyo, 13 hotels in leading resort areas and trade centers in Osaka, Yokahama and Kobe.

Estimated cost is $100 million. Included among the sponsoring group are Conrad Hilton of the Hilton hotel chain and George Killion, president of American President Lines. —p. 64

* * *

MOTORDOM IS BOOMING: One of the miracles of this still young 1950 is the remarkable pace of new automobile sales in January. A few of the builders established new all-time highs in deliveries last month and almost all surpassed January, 1949, deliveries by impressive margins.

This promising start for the new year is significant because there has been considerable speculation as to whether or not motordom can continue its hectic postwar pace without going through the wringer of a painful adjustment such as those which have plagued practically every other major industry. It will be recalled that the industry is aiming at an assembly of about 5.6 million cars and trucks in 1950 against a record-breaking output of around 6.3 million units last year—an estimated decline of 11 per cent.

Two factors mar the present rosy outlook. One is the Chrysler strike and the other is that the coal strike threatens to affect the six-day week and other overtime schedules in motordom.

—p. 67

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

COAL—Coal strikes are more an effect than a cause of the bituminous troubles (p. 53). An unemotional examination of the coal problem will show you that, although the situation is complicated by the personality of John L. Lewis, basically it is a matter of too much production. We'll have more coal strikes unless the real trouble is solved. We'll have more steel and power shortages to plague metalworking if off-again-on-again coal output is not somehow regularized.

PRODUCTION—Despite the coal and Chrysler Corp. strikes, metalworking production thus far this year has been near alltime record peaks. It won't last much longer if coal stocks continue to dwindle. All General Motors Corp. divisions built 275,852 vehicles in January, against 149,027 a year ago (p. 67). This was just 15,000 short of the alltime high last August. Ford Motor Co.'s operations are at capacity, and the company is well on its way to the best first half in history. But Chrysler has lost an estimated 90,000 cars and trucks valued at $108 million since its strike began Jan. 25.

RAILROADS—Even in another transportation field—railroads—things may be looking up. The boom-or-bust cycle in the freight car building industry could be leveled out if a new leasing plan is generally adopted. Its details are still being worked out. Interests independent of the railroads—mainly insurance companies—would buy freight cars from independent builders and lease them to the roads on a per diem basis, without railroads having to put up any cash. Cash is a factor that limits railroad buying to the most prosperous times. Orders for diesel engines and passenger cars (p. 59) have increased. New York Central, Western Pacific, Seaboard Air Line, Union Pacific and Chicago & Northwestern have all placed contracts.

CONSTRUCTION—Industrial construction continues at a fast pace. Some major projects are at Consolidated Western Steel Corp.'s Orange, Tex., plant (p. 55), Truscon Steel Corp.'s Gadsden, Ala., facility (p. 72), Carnegie-Illinois Steel Corp.'s Gary, Ind., works (p. 57) and on the Cuyahoga river in Cleveland (p. 64). This last is a bridge-lifting project to improve navigation on the waterway . . . High construction level is aiding manufacturers of equipment to crush stone (p. 57) . . . The construction industry may also provide a new market for steel wire (p. 55). Wire can be used to prestress concrete structurals.

EXPORTS—Metalworking exports are still in the doldrums, but they may improve if Britons elect a Conservative government Feb. 23 (p. 63). Not that the Conservatives would go on an American buying spree if they win. They would co-operate more than Laborites with ECA on trade matters that eventually would help the U. S.

O'MAHONEY BUSINESS BILL—The new O'Mahoney bill to stimulate private enterprise through long-term loans by a proposed chain of capital banks seems a questionable cure for the disease of dwindling private investments (p. 60). The bill offers no remedies for the basic condition causing the famine in private investments—unfavorable tax laws.

STEEL PRICES—If steel sales slow down, look for revisions in extras (p. 56). Some steel producers are already studying the situation; they fear the extra changes instituted a month or more ago will price them out of the market on some items.

HERE AND THERE IN INDUSTRY—Western Europeans—all must follow the British lead to some extent—look for government style changes after the Feb. 23 election (p. 63) . . . Nearly 60 manufacturers of zippers are doing $70 million worth of business yearly and expect to do more in 1950 (p. 58) . . . Rheem Mfg. Co. has bought the equipment and inventory of Wheeling Steel Corp.'s range boiler and tank plant at Portsmouth, O. (p. 72) . . . Barium Steel Corp. has resumed full operations at its newly acquired Phoenixville, Pa., bridge and fabricating plants (p. 58).

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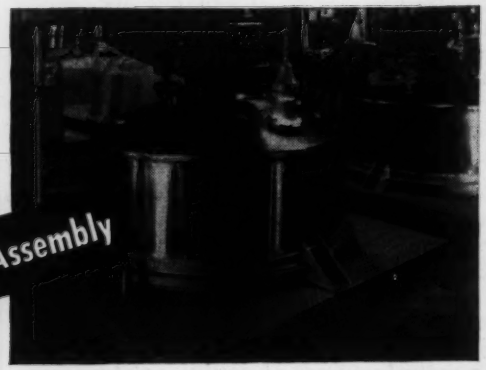

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STEEL
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Needed Now: Coal Cure

But it must be more than an antihistamine, for current critical situation only mirrors fundamental illness of the industry—too much capacity for present market

INDUSTRIAL production to the end of last week had not suffered too greatly from the 10-month deadlock between coal miners and operators. But a sharp decline will start this week unless large-scale mining is resumed.

Many steel and metalworking companies are withholding curtailments in the hope the miners will return to work this week. But overall coal stocks are critically low. They are unevenly distributed. If an early flow of the fuel is not assured, reductions in operations over the next two weeks may be sharper than any experienced in recent years.

Steel Output Eases — Steelworks operations last week dropped only 2.5 points to 91.5 per cent of capacity. The drop in blast furnace operations was much sharper and some steelmaking furnaces are operating on cold iron.

Metalworking operations are just beginning to be affected. General Motors has suspended scheduled overtime work. Other metalworking companies are watching the coal and steel supply situation on a day-to-day basis. They will cut soon if the supply outlook does not improve.

Power companies generally carry substantial coal stocks and many are fairly supplied at present. There are outstanding exceptions and power is being rationed in some communities.

Bottom of Hoppers—Railroads are scraping the bottom of the hoppers. Service is being curtailed. Some roads have been forced to seize coal in transit to maintain operations.

Many public institutions are running out of fuel. Plans to divert industrial supplies to such institutions were being talked over last week and the possibility of channeling the scant shipments of fuel moving to essential public uses is being considered.

Ills Run Deep—The less emotional observers of the imbroglio that has existed in coal since last March—and before—believe that any settlement reached in the current contract dispute will be only a sedative. A cure will require fundamental readjustments within the industry.

Basically, the coal industry today is cursed with too much capacity for its present market. Coal mines range from the highly efficient captive units operated by the steel companies and some commercial companies, through moderately efficient mines down to marginal and "snowbird" units.

Working a normal work-week and employing all the miners, the industry is capable of producing more than 600 million of tons a year. Production in 1949, when at least 120 working days were lost by strikes, totaled slightly more than 400 million tons. And there was no real shortage.

Many Use Other Fuels—Complicating the surplus problem is this: Many users have turned to oil, gas and other sources of heat and energy as result of the uncertainty as to coal supplies and the increasing cost of coal made necessary by the miners' demands for high wages and large welfare benefits.

Should all the miners return to work on a 5-day week basis, a coal surplus again would result in a comparatively short time.

What's the Solution?—These observers frankly do not know the solution to the basic problem. Many believe that only the more efficient mines should be operated during peacetime. This would mean the closing of many less efficient mines and would throw perhaps 150,000 of the 400,000 coal miners out of jobs.

Some suggest that if this solution is adopted, part of the welfare fund of the United Mine Workers should be used to establish displaced miners in other employment.

Others believe coal production should be regulated. This, of course, was the aim of John L. Lewis in ordering a 3-day week and of his proposal to establish a czar for the industry to regulate coal production in line with consumption.

Members of President Truman's fact-finding board, David L. Cole, William W. Wirtz and John T. Dunlop (see photo), are charged with investigating the facts of the present contract dispute. Metalworking executives, who want freedom from interruptions to their steel, coal and

NEA

TRUMAN'S BOARD DIGS FOR COAL FACTS
. . . industry's problem goes beyond John L. Lewis

power supplies, believe a more fundamental and permanent correction is needed for the coal problem.

Stockholders Approve Pensions

Pensions for wage earners won easy approval from Bethlehem Steel Corp. stockholders at a special meeting Feb. 7. Other steel companies are asking stockholders to give the necessary approval to the new pension plan at meetings scheduled over the next several weeks. Most plans call for $100 a month retirement allowances, including social security, for workers retiring at 65 after 25 years' service.

In calling the special shareholders' meetings, steel management is asking that the pension proposals be approved.

Although the vote for the pension proposal at Bethlehem was nearly three to one, minority stockholders were opposed to what they termed a "something for nothing" philosophy.

Phone Dispute to Mediators

Federal mediators this week will attempt to effect a settlement in the smoldering dispute between the Communications Workers of America-CIO and American Telephone & Telegraph Co. A strike, originally scheduled to start Feb. 8, was postponed to Feb. 24 at Federal Mediator Cyrus S. Ching's request. Only previous national telephone strike — in 1947 — lasted six weeks.

Issues involve wage increases, reduction in the work-week from 40 to 35 hours, improvement in vacation schedules, pensions and insurance.

Legal—But Is It Loyal?

Strikes may be legal, but are they loyal to America?

This question is posed by the Detroit Board of Commerce in page advertisements appealing to workers to stay at their jobs while employers and employees figure out a practical solution to the pension and other issues.

The Chrysler stoppage, coal strike and threatened communications walkout are damaging the country's industrial strength, says the board. "Could it be that Moscow's fifth column is setting America up for that Sunday punch?"

Pointing out that the pension problem is America's newest and biggest riddle, the board suggests more patience until Congress writes the new ticket for Social Security and employers can learn where they stand and what they can do.

Overtime Rules Interpreted

How revised overtime pay provisions which took effect Jan. 25 under the Fair Labor Standards Act will be applied by the Department of Labor is discussed in an interpretive bulletin on "Overtime Compensation." Copy of the bulletin may be obtained from Wage & Hour and Contracts Divisions of the Department of Labor. Text of the bulletin also appeared in the Federal Register of Feb. 4. An analysis of the new rulings appeared in STEEL, Dec. 26, 1949, p. 21.

Copper Workers Get Raise

International Union of Mine, Mill & Smelter Workers-CIO won a 5-cent hourly wage increase from four large copper and brass companies. Companies are American Smelting & Refining, Kennecott Copper, Phelps Dodge and American Brass.

Payroll High Despite Strike

Iron and steel industry's pay-roll in 1949 was the second highest in history and average hourly wage rates were the highest ever recorded.

Last year's payroll totaled $2,061,770,000 and was second only to the 1948 total of $2,234,461,000. Payroll during the first nine months was higher than ever before but the steelworkers' strike in October and November lowered the year's total, says the American Iron & Steel Institute.

Wage earners received more than $1506 million of the total payroll; their earnings per hour averaged $1.703, compared with $1.629 during 1948. Hourly earnings of all employees averaged $1.807 last year, compared with $1.713 in 1948.

Estimated total employment for the entire industry during 1949 was 620,500, a decline from 1948's 635,600.

During the fourth quarter, which included the steelworkers' strike, the payroll of the iron and steel industry totaled $391,340,000. Hourly payments to wage earners averaged $1.742. They worked an average of 24.7 hours per week. Estimated total employment during the quarter was 590,000.

Unemployment Hits Peak

Unemployment rose to a postwar high of 4,480,000 in mid-January, says the Census Bureau. Secretary of Commerce Charles Sawyer says the increase is due largely to "seasonal" layoffs. Industrial employment "does not appear to be materially affected."

Total employment is estimated at 56,947,000 persons, down 1,609,000 from December. The drop in employment was greater than the rise in unemployment because some part time workers left the labor market. Employment last year at this time was 57,414,000.

Mr. Sawyer says that unemployment figures rose similarly between December, 1948, and January, 1949. That rise was more serious than this because industrial layoffs were an important factor.

Previous joblessness peak was just over 4 million in last summer's recession.

Building Best In 25 Years

New home building in the San Francisco-Oakland area during 1949 was the largest since 1925.

The total of 20,220 units started last year exceeds the postwar record of 1948 by 300 units, and compares with about 25,000 units in 1925.

A high rate of building activity now underway indicates the possibility that 1950 construction may be heavier than last year.

Another trend expected to carry over from 1949 to 1950 is in the demand for lower priced buildings. Several economies in construction made possible reduced costs last year.

The average cost of units started in 1949 was $9400, compared with an average of $10,000 in 1948.

Abrasive Prospects Good

Bay State Abrasive Products Co., Westboro, Mass., expects continued high business volume for 1950.

Its sales were generally good in 1949 in spite of the general recession last summer. The company completed a $250,000 expansion program last year. In 1950 it will spend $200,000 for new machinery, equipment and buildings.

Servel Line Expanded

Expanded availability of natural gas prompts Servel Inc. to introduce a complete new line of air conditioning equipment. The units can be operated on gas or steam.

The line includes an all-year air conditioner and an absorption cooling unit, to which may be added the steam generator heating unit, humidifying and dehumidifying element, fan filter unit and the control unit. The Evansville, Ind., company also makes gas refrigerators.

Servel says its products will eventually have a national market because of the greater availability of natural gas. Until recently, no vigorous sales effort could be made in areas served by about 60 per cent of the nation's gas meters. This was because of restrictions in those areas on the use of gas for home heating where demand exceeded supply.

Up until now, Servel had been concentrating its sales efforts for air conditioning apparatus to new homes and buildings. Now it is expanding its sales coverage to existing buildings.

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More Plate, Pipe for Texas

Consolidated Western's expanded plant will produce at capacity in March

NEW plate fabricating shop of Consolidated Western Steel Corp. at its Orange, Tex., plant, will be in full operation by Mar. 1, and a new pipe mill is scheduled to begin production about Mar. 15.

This is announced by H. C. Cranfill, vice president in charge of administration for the U. S. Steel subsidiary. The new plate and pipe mills are a major part of the expansion program begun following the purchase of the Orange wartime shipyard from the government in November.

Ahead of Schedule—Conversion of the shipyard properties into additional fabricating facilities is ahead of schedule. The yard is adjacent to Consolidated Western's present structural steel fabricating plant. Part of the plate mill already is in operation, and a considerable amount of plate fabrication is being turned out.

Several units of plate shop machinery and equipment have been received and are being installed. The shop will be devoted to light and heavy plate fabrication of mild steel, stainless steel and nickel-clad vessels. Its output principally will be for the Gulf Coast's petroleum refinery and chemical industries — towers, tanks, pressure vessels, heat exchangers, sugar vats and other oil and chemical refinery equipment.

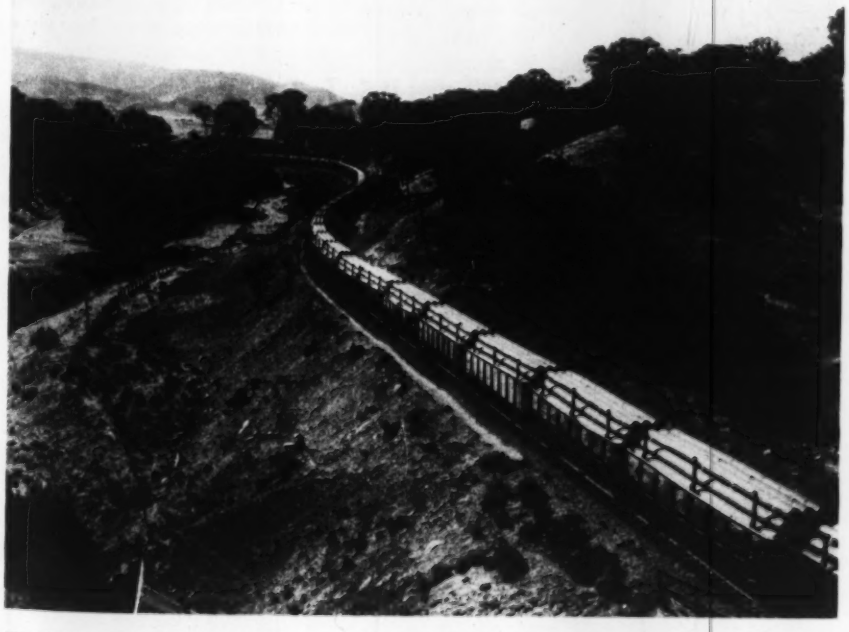
For the pipe mill, two large steel structures are being connected into one building 85 x 900 ft.

Freight Tunnel Proposed

CONSTRUCTION of a huge two-level tunnel costing $60 million, and providing faster access from San Joaquin valley through the Tehachapi mountains into Los Angeles, is being urged on the California Legislature by a strong group of California civic organizations.

Tunnel would be restricted to trains and trucks, and would speed the delivery of freight and produce. Sponsored by the Chambers of Commerce of Los Angeles, Kern, and Bakersfield counties, the project would be self-liquidating. It would be one of the largest mountain tunnels in the U. S.

Kaiser Steel—Basalt Rock Combination at Work



TIMES ARE CHANGING in the West. Evidence of this is a trainload of steel line pipe produced on the West Coast and bound for a pipeline project in the oil fields of Louisiana and Texas.

Only a few years ago large diameter pipe was produced only in the East and the South. But development of an integrated western steel industry by Kaiser Steel Corp., combined with modern pipemaking facilities of Basalt Rock Co., Napa, Calif., now gives the pipeline industry a new source of supply (See STEEL, Aug. 15, p. 63).

The 60-car train (see cut) is winding through Tehachapi pass in California over the Southern Pacific mainline. The single shipment contained enough 20-inch pipe to lay 9½ miles of pipeline in a project now under construction by Texas Eastern Transmission Corp., Shreveport, La.

New Markets for Wire?

It may be used extensively in construction if prestressed concrete design is widely adopted

NEW markets for high strength steel wire may be in the making if prestressed concrete design is widely adopted in this country. First major installation of prestressed concrete to a bridge floor is underway on the four-lane Walnut street automobile bridge in Philadelphia. Other types of structures such as girders, airport mats and road surfacing have been successfully tested.

Employed extensively in Europe and South America for a number of years, prestressed concrete construction has been confined to cylindrical members such as pipes and tanks in the United States.

Roebling Experiments — John A. Roebling's Sons Co., impressed with the economy, appearance and engineering advantages of prestressed concrete, has been experimenting with various prestressing techniques and materials since 1944. Last week, Blair Birdsall, assistant chief engineer of Roebling's Bridge Division told a Chicago meeting of the Western Society of Engineers and the American Society of Civil Engineers that prestressed concrete is "almost certain to find wide application in this country."

Wire does to a concrete member what pressure applied by your hands does to a row of side-by-side books. Without pressure on the books, they would collapse if any weight were on top of them. With pressure applied to the outside books in the row, they form a self-supporting beam. Pressure is applied to concrete by reinforcing steel wire placed through a cavity in or alongside the member. The wire is then put in tension by taking up on nuts.

Construction Gains

An estimated $1.5 billion worth of new construction was put in place in January, an alltime record for that month and 16 per cent above January, 1949.

Departments of Commerce and Labor say private outlays for all types of new construction amounted to more than $1.1 billion—off 7 per cent from December. Housing alone accounted for $650 million.

Industrial plant construction was about the same in January as in December, a level considerably below that of a year earlier. Public expenditures for new construction were 24 per cent higher than in January, 1949.

Extras May Change If Steel Sales Lag

Some producers, apprehensive over effects of new extra charges, study price structure. They fear they may be pushing themselves out of the market

DON'T be surprised if price extras on steel are revised quickly should sales slow down.

Only a month and a half ago extras were revised but in this short time some producers, particularly makers of sheet, have become fearful that these new extras will price them out of the market.

Little Bit Worried — Among the most concerned are producers whose sheet capacities are limited largely to narrow widths. The revised extras that became effective in December make it increasingly advantageous for consumers to specify wide sheet rather than narrower widths. For instance, a leading producer's gage and width extra for hot-rolled, mill edge, coiled carbon sheet 12 to 15 inches in width is now 50 cents per hundred pounds for seven gage and heavier. It had been 10 cents. Eight to 13 gage is now 50 cents. It had ranged from 15 cents to 35 cents. Fourteen gage is now 60 cents. It had been 40 cents. Fifteen and 16 gage are now 65 cents. They had been 50 cents. Seventeen and 18 gage are now 70 cents. They had been 55 cents and 65 cents, respectively.

A Better Buy—On the other hand, the gage and width extras for the same product in widths 23⅛ to 48 inches went up less sharply and in some instances went down in the last revision. For instance, seven gage and heavier is now 30 cents a hundred pounds. It had been 10 cents. Eight to 13 gage is now 30 cents. It had ranged from 15 to 35 cents. Fourteen gage is now 30 cents, compared with a former 40 cents. Fifteen and 16 gage are now 35 cents. They had been 45 and 50 cents, respectively. Seventeen and 18 gage are now 45 cents. Previously they were 55 and 60 cents, respectively.

Why did producers whose sheet capacity is predominantly in the narrower widths fall into line with changes that U. S. Steel initiated in extras? The answer was given at the recent steel price hearings held in Washington by the Joint Congressional Committee on the Economic Report: Steel price relief was needed.

Natural Thing To Do—So, with producers feeling additional price increases necessary and with steel demand remaining strong, it was not surprising the increases in extras were adopted universally even though the revisions may work later to the detriment of some steel companies, observers say.

ROLLING 'EM OUT: Coming off production lines in eight widely scattered Jones & Laughlin Steel Barrel Co. plants are some 25,000 barrels every eight hours. In 1940 J & L was producing only a few thousand oil drums a day from a single factory in Bayonne, N. J.

Since then the pricing experts have been busy calculating where they will be competitively if demand softens and how they can revise the revised extras to get business and not endanger their companies' financial positions.

Finding Ways To Save Money

New patterns of purchasing steel are emerging from the revision of price extras. The changes reflect consumers' moves to hold their steel costs as low as possible.

Among the effects noted by steel sellers is a substantial reversal in customer's specifications of mill edges rather than cut edges for sheets. As a result of this switch, nearly 90 per cent of one sheet producer's volume in January represented shipments of mill edge material rather than the formerly predominant cut edge stock. A leading producer now charges from 15 cents to 30 cents per hundred pounds for side cutting coils of hot-rolled carbon steel sheets in coil form and from 10 cents to 25 cents per hundred pounds for side cutting cut lengths of sheets. The charge depends on width of the coil or flat sheet.

Some consumers are realizing considerable savings by slightly revising specifications from one width, gage or length bracket to those on which lower extras apply. One strip consumer, for instance, has revised size specification to fall within the bar extra schedule to take advantage of substantially lower size extras which more than offset a $4 a ton differential in the base price of hot-rolled carbon bars over the base price of hot-rolled carbon strip.

Additional cost savings also are possible by avoiding all unnecessary processing extras to meet better than commercial quality needs. The former sheet and strip "special requirement quality" extra of 60 cents per hundred pounds, for example, has been broken into a detailed list of specific and restricted test requirement extras in addition to a new extra of 35 cents per hundred pounds for special soundness quality.

Revision of packaging specifications offer additional savings, including possible alteration of consumers' unloading facilities that may now be restricted to three-ton lifts to permit handling of base quantity lifts of five tons.

U.S. To Buy More Bins

COMMODITY Credit Corp., Washington, expects to buy bins and storage structures to accommodate at least 100 million bushels of grain. To obtain fast action, manufacturers of circular steel, circular aluminum or prefabricated wooden grain bins are asked to file offers not later than Feb. 20, 5 p. m. There will be no public opening and each offer will be considered when received. Awards will be announced beginning Feb. 21.

Specifications and drawings may be had from director of transportation and warehousing branch production and marketing administration of the United States Department of Agriculture, Room 1096, South Agricultural Bldg., Washington.

L.A. Starts New Industrial Area

DEVELOPMENT of a new $15 million industrial area near Los Angeles International Airport is scheduled for completion within the next four years.

Located on a 95-acre tract adjoining the airport, the factory area will provide space and utilities for nearly 100 plants. Five of these now are under construction.

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Stone Crushing

Business keeps pace with highway, other construction. Equipment demand heavy

MAKING little rocks out of big ones is big business and suppliers to the crushed stone industry expect it to continue to be good business.

Uses of crushed stone are many, and much of the machinery used for its production is complex, costly and cumbersome. These include such items as power shovels, conveyor systems, crushing mechanisms, screening devices. Certain trends are developing which have machinery makers pondering about their effect on the future course of equipment buying.

More Portable Plants—Most significant of these is the mushrooming of "roadside" plants, operated by contractors and capable of being moved from site to site. These are making things a little tough for the stationary plant operators.

In back of this development are freight rate increases, these being cited by one operator as constituting the most upsetting factor in the industry "in our lifetime." So important is this addition in cost that it is forcing changes in construction specifications, with the result, crushed-stone men say, that physical requirements of aggregates, particularly those used for secondary road construction are being lowered.

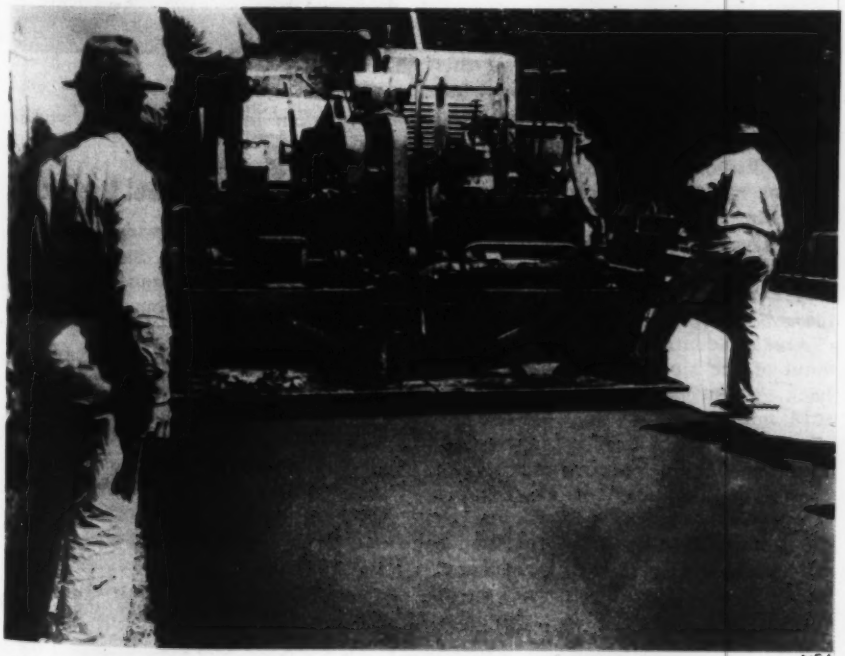
Road Funds Are Problem—Another long-range worry of the crushed stone people and thus of direct concern to builders of their equipment involves state highway departments. Many of these, the industry says, are already seriously handicapped by lack of funds. Where revenues for highway construction are derived from motor taxes or taxes on petroleum products, both of which may have reached a top limit, any increase in construction funds must come from greater traffic volume which accelerates highway wear and tear. Fear of the industry is that curtailment of highway programs may soon be necessary, but probably not in 1950.

Builders of stone crushing machinery are concerned over the diversion of highway funds to other uses.

Highways Biggest Outlet—Most important use of crushed stone is for highway construction, the percentage to total production varying from 86 per cent in New England to 35 per cent in central U. S. Other important uses are as railroad ballast, for chemical and metallurgical purposes, for building construction.

During 1949 crushed stone production showed little change from 1948. Volume was slightly lower in the Midwest, central, northern and western states, higher in the eastern and southern sections. Expectations are that output will remain fairly constant in 1950, declining in the northern, central and southwestern states and rising in the Midwest. Plant capacity on the whole is sufficient.

Good Business Ahead—Stone crushing equipment builders cannot accurately translate highway construction plans into sales expectation figures, but they are confident that the mileage figures spell good business. Federal aid program for secondary, or farm-to-market, road construction in the first four postwar years involved improvements on 52,000 miles of roads, 16,000 miles of which remain to be constructed. At present rate of federal aid authorizations consumption of aggregates, of which crushed stone and gravel make up approximately one-fourth, will be about 24 million cubic yards a year.



NEA

MOST IMPORTANT USE OF CRUSHED STONE IS FOR HIGHWAY CONSTRUCTON

. . . machinery makers ponder developing trends

A Bang-Up Cost-Cutting Tool

HERE's a cost-cutting tool for construction and maintenance.

It's a power-actuated driving tool that was used for installing metal door frames at a new multimillion-dollar hospital at Shreveport, La. Made by Mine Safety Appliance Co., Pittsburgh, the cartridge-powered drivers helped craftsmen install 2200 door frames directly to concrete floors and arches in half the time that conventional methods would have taken.

The savings realized, says the company, could pay for one such tool almost every two days. Savings of almost 2200 man-hours resulted from the use of the tool at Shreveport.

Weighing less than five pounds, the MSA Velocity Power Driver imbeds studs in a fraction of a second by the discharge of a blank cartridge. The studs have holding power up to several thousand pounds once they are imbedded. The driver can be used for fastening fixtures to metal walls or I-beams as well as to concrete.

Mine Safety Appliances officials say every precaution has been built into the tool to minimize hazards. It has no flash or recoil and makes little noise.

J. W. Bateson Co., Dallas, the contractor on the Shreveport hospital, found the drivers were useful for other jobs, too: Fastening laundry chutes and duct work to concrete walls, pinning up furring channels for wire lath and installing electrical conduit and junction boxes.

Carnegie-Illinois To Expand

U. S. STEEL Corp.'s Carnegie-Illinois Steel Corp. will increase Chicago district production of cold reduced sheets by about 200,000 tons a year.

This increased production will be obtained without major additions to plant facilities at the Gary, Ind., Sheet & Tin Mill where the sheets will be rolled. The program, which will be completed in about 15 months, includes improvements and modernization at the Gary Sheet & Tin Mill

and at the Gary Steel Works where the slabs are produced for the sheets.

At the sheet and tin mill the existing temper mills and pickling lines will be modernized to increase their capacity, and an additional shear line will be installed. At the steel works the 36-inch slabbing mill will be revamped with installation of modern soaking pits, an ingot stripper and mill auxiliary equipment.

Cold Metal Buys GE Drive

A GENERAL Electric Co. twin motor drive has been ordered to meet an unusual application on a cold reduction mill for Cold Metal Products Co., Youngstown. Designed to handle specialty steel and chrome alloy products, the new unit will be installed early this year.

The GE twin drive, consisting of two 100-hp motors, will be directly connected to the backup rolls of a four-high reversing cold strip mill and will provide a maximum strip speed of 1800 feet per minute. Normal drive is to the work rolls of a cold strip mill instead of the backup rolls.

In addition, each reel drive will have two identical 75-hp motors arranged for tandem connection. The complete system of electrical equipment to be supplied by GE will also include one 200-kw main generator, two 150-kw reel generators, one 25-kw general purpose exciter and one 600-hp synchronous driving motor for the motor-generator set.

Boiler Plant in "Mothballs"

LUKENS Steel Co.'s main boiler house at Coatesville, Pa., is in "mothballs." The four boilers in the house were in use since 1918, but have now given way to the more efficient electricity. The boiler house will remain as a stand-by plant.

Barium Opens Phoenix Plants

BARIUM Steel Corp. has resumed full operations at its newly acquired Phoenixville, Pa., bridge and fabricating plants. The previous owners shut down five months ago.

Phoenix Bridge Co. and Phoenix Iron & Steel Co., which own the plants, were acquired through a subsidiary last fall by Barium as part of its integration program. The property has been improved and rehabilitated to cut operating costs.

Reynolds Boosts Output

FIRST capacity operation of Reynolds Metals Co.'s Jones Mills, Ark., aluminum reduction plant since the war will occur late in March.

The plant has four pot lines and an annual capacity to produce 144 million pounds of aluminum. When Reynolds leased the plant from the government in 1946, it was possible to start up only two of the four pot lines because of a shortage in economical electric power. Full operations will be made possible by Arkansas Power & Light Co.'s power plant expansion soon to be completed.

Zippers—They're Up

Slide fastener business totals $70 million annually. Sixty companies make them

HOW to make both ends meet has been bothering men for centuries. Zipper manufacturers are dealing with one aspect of the problem—and selling $70 million worth of slide fasteners yearly to do it.

That dollar volume is about 50 per cent more than it was in 1939. The industry output in 1949 was about 10 per cent higher than a year earlier. Production this year is expected to increase another 10 to 15 per cent. Today about 60 companies make metal zippers, compared with about 15 in 1939. Most zippers are manufactured from various nonferrous alloys. Major parts are the slider and the chain. For the chain, flat or round wire is used, from which the small elements are chopped off then clamped onto the tape.

Patents in 1852 — U. S. records show that patents on hookless fasteners were applied for as early as 1852, but none were commercially successful until the beginning of this century. First U. S. patents on what was the immediate forerunner of the modern zipper were taken out by W. L. Judson of Chicago. From 1893 to 1902 he blazed a trail for the zipper. Mr. Judson became associated with Lewis Walker for commercial production of the invention. Out of this association came Hookless Fastener Corp., now called Talon Inc.

Another contributor to the development of the zipper was Gideon Sundback, a Swedish-American who in 1913 improved the design so the device could not unlock when twisted. The Sundback invention assured the commercial success of the zipper which was first used in volume by the American army in World War I.

The zipper was slow to be accepted in Europe. Kynoch Ltd. of Great Britain held extra-U. S. rights, but the device was not sold in England in quantity until 1925. Zipper manufacturers are well established abroad now. This factor hampers any sizable export business by American companies.

Woman of Industry

Many consumer products are designed for women, but how many by women? The zipper industry boasts a woman executive who has contributed to product design, particularly a fabric-covered slide fastener.

She is Mrs. Hermine Axthelm, just retired as vice president and general manager of Waldes Kohinoor Inc., Long Island City, N. Y. She started with the firm at 16 as stenographer and typist. She began in the European plants of Waldes and shortly afterward became secretary to Henry Waldes, president and co-founder. After World War I, an American corporation was established. In 1921 Mrs. Axthelm came to New York to take charge of the factory.

MRS. HERMINE AXTHELM

. . . zipper industry boasts a woman

Texas Firms Sue Steel Producers

A SUIT under the Sherman Antitrust Act has been filed in San Francisco federal court against most of the nation's major steel companies. The action was brought by Aero Sales Co. and Texas Tank Co., both of Houston.

The complaint is based on alleged discrimination by the steel companies against new customers under the system of allocating steel on the basis of the customer's purchases in 1939, 1940, and 1941. Damages of $4,516,500 are asked.

In its suit, Texas Tank Co. claims that as a result of refusal of the steel companies to supply its needs for steel sheets, it was unable to produce butane and other containers.

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Doomed to the acetylene torch . . .

by new motive power units as . . .

Diesels Replace Coal Burners on Switch and Road Haul

NEW YORK CENTRAL System is paying $14.5 million for 133 yard and road switching diesel-electric locomotives and four units of road passenger diesel-electric power—a total of 137 power units.

The newly ordered engines—they have 136,000 hp together—will bring the total diesel-electric horsepower of NYC and affiliated railroads to 1,117,000, constituting 998 units of power.

Deliveries are expected to begin in June and to be completed before the yearend. The lineup on the orders is:

GM Electro-Motive Division—twelve 1500-hp road switchers; six 1200-hp yard switchers; eighteen 1000-hp yard switchers; two 800-hp yard switchers; and twelve 600-hp yard switchers. (Twenty-four 1200-hp yard switchers were ordered last year from Electro-Motive for the affiliated Indiana Harbor Belt Railroad as a previously announced part of this order.)

American Locomotive Co. — four 2250-hp road passenger "A" units; eight 1500-hp road switchers; nineteen 1000-hp yard switchers; and thirty 600-hp yard switchers.

Lima-Hamilton Corp. — sixteen 1000-hp road switchers.

Fairbanks, Morse & Co.—ten 1000-hp yard switchers.

Stainless Steel Job for WP

Western Pacific Railroad bought one of Budd Co.'s new self-propelled, stainless steel diesel cars for service on its line between Sacramento and Salt Lake City. Cost of the car is $127,800. The new car is the first of its model to be sold by Budd. Two similar earlier models were ordered by the New York Central System. The car is powered by twin 275-hp General Motors diesel engines.

Gas Turbine-Electric Engine

The nation's first gas turbine-electric locomotive has "performed successfully under almost every conceivable operating condition" in road tests thus far, G. W. Wilson, manager of General Electric's Locomotive and Car Equipment Divisions, says.

In reporting on the test status of the 4500-hp developmental unit, Mr. Wilson said it has operated 27,500 miles in service tests on various railroads since it was placed on the rails in November, 1948. Built by American Locomotive Co., it has been in freight service on the Union Pacific Railroad since last July.

Despite results to date, Mr. Wilson warns: "It is still far too early to draw any conclusions about its future on American railroads." The 500,000-pound, single cab locomotive outwardly resembles a diesel-electric unit, but inwardly it is far different. The power plant developed by GE Turbine Divisions in Schenectady, N. Y., is a gas turbine similar in principle to those in jet planes, but there isn't any jet or thrust effect as in planes. The turbine is connected through reduction gears to electric generators.

Seaboard Buys 36 More

Orders for 36 additional diesel road locomotive units were placed by Seaboard Air Line Railroad.

Electro-Motive Division of General Motors Corp. will build 18 of the engines. They'll be of 1500 hp each. The other 18 will be built by American Locomotive Co. and will be of 1600 hp each.

Seaboard said the cost would be $5 million. The order was the second announced by Seaboard this year. In January it reported it was buying 26.

Republic Dieselizes

BY DIESELIZING its railroad operations in Youngstown, Republic Steel Corp. is aiding the city's smoke abatement program.

The company has just bought five more diesel switchers, increasing its fleet to 12 units, including two diesel cranes. It retired 13 steam locomotives and four steam cranes. It still has 20 steam switchers in the Youngstown district. That Ohio plant has 56 miles of track within the 235-acre property. It also has 500 cars.

Pennsy Improves Service

Pennsylvania Railroad is improving its fast merchandise freight service.

Aim is to fully restore the high type of service for less-than-carload freight provided by the Pennsylvania before the war. Necessities of the war and postwar periods made it impossible for the road to maintain its standards of speed.

100 Streamliners for UP

Construction of 100 streamlined passenger train cars, 85-feet long, for Union Pacific and Chicago and Northwestern railroads is nearing completion at the St. Charles, Mo., plant of American Car & Foundry Co.

Already delivered and in service are 21 dining cars, 28 club and cafe-lounge cars and 32 head-end cars for mail, baggage and express. The remaining 19 cars are sleepers, nine of which are already in service. All passenger-carrying cars are air-conditioned. The 48-seat diners, says ACF, feature the first regular use of dry ice as a dining car kitchen refrigerant.

"More Power to America"

The "More Power to America" Special, first train of its kind, will be started on its merry way across the continent this spring by General Electric's apparatus department.

Exhibits of more than 2000 electrical products, processes and techniques ranging from precise aircraft instruments to complex working models of steel mill, textile and other industry equipment, will be displayed throughout nine cars of the train.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

It's an on-again-off-again attitude Washington displays toward encouraging investment in private enterprise. Senator O'Mahoney's new bill is of the on-again variety.

THE NEW O'MAHONEY bill, S. 2975, to stimulate private enterprise through long-term loans by a proposed chain of capital banks caused some surprise in Washington.

It comes after a thorough study by the senator's Joint Committee on the Economic Report which revealed that the principal reasons for the current hesitancy in investing private savings in industry are the discouragements which the government throws in the way of such investments.

High up in the obstacles to the flow of new savings into industrial enterprise and expansion are those provisions of the tax law which force corporations to show as profits the just portion of the earnings that should be charged off to depreciation. The double taxation of corporate earnings· first on profits and again on dividends, is another important deterrent to investment capital.

Ignoring the real need, which calls for reforms that will give the investor a fair hope of getting a profit on his money, the O'Mahoney bill seems to provide a questionable cure for the disease.

The chain of banks it contemplates would be set up with private capital and is intended to be the source of capital for small, independent enterprise. The government would have the say which applicants fitted this category and could be approved for loans. The incentive to attract capital for the capital banks is a provision that the income of these corporations would be tax-free the first 15 years. But the bill contains nothing to relieve the prospective borrowers of the handicaps imposed by existing tax laws—handicaps which are the real reason why the majority of these firms are unable to raise capital from normal sources today.

Suggested by Dr. A. D. H. Kaplan, Brookings Institution, the measure provides for full supervision of the corporations by the Federal Reserve board of governors. The Federal Reserve governors and the Secretary of Commerce would rule on the eligibility of loan applicants under this definition. The new banks would have authority to make loans, to invest in the equity shares of existing business, and to insure $10,000 business loans of commercial banks for five years. Character loans, as well as those backed by collateral, would be permitted. Large loans would be permissible provided that the aggregate of loans above $250,000 by any single bank did not exceed 25 per cent of the bank's capital and surplus.

"With private savings at record levels throughout the country, the private enterprise system is starving for lack of debt and equity capital," said Senator O'Mahoney when he introduced the bill. He believes the bill will establish machinery "whereby the savings of the people may be channeled safely and profitably into investments that will permit maintenance of present high levels of production and employment."

Security is the Watchword

MAYBE it's because of the arrest of Dr. Klaus Emil Julius Fuchs that security is again assuming the attention that it did during the war. Anyway, after a period of comparative laxity in security measures, sealed lips are again the mode in Washington.

Latest development is the President's executive order defining the establishments at which it is unlawful "to make any photograph, sketch, picture, drawing, map, or graphical representation" without the permission of proper military authority. Violators are subject to fines of not over $1000 or a year's imprisonment.

The order applies to everything that now is—or may be—covered by the designations "top secret," "secret," "confidential," or "restricted." Such designations are in effect now. They will be more widely used to cover military, naval and air-force installations and equipment, and military production in manufacturing plants.

To manufacturers the order throws up this hand of caution: Before photographing any classified work going through their shops they should get approval from the contracting officer. The same holds good in using photographs of such work, finished or in process, in their advertising copy.

Another important security development is revision by Defense Secretary Louis Johnson of a previous ruling that a contractor or prospective contractor would be denied a contract containing classified information if he had any employe who could not be given security clearance. The revised ruling provides that security clearance is needed only for such employees that have access to the classified information.

Washington style note

Navy Labor Relations Men

THE NAVY is stepping up training in labor relations.

Bearing in mind a lesson of the war—that difficult labor problems can be handled most effectively by trained men—the Navy already has created a standby corps of 375 labor relations specialists.

The trainees are members of the officers' reserve corps. They're being given two-week courses at Navy shore establishments in Hawaii and on the Pacific and Atlantic coasts.

Uncle Sam A Real Uncle

UNCLE SAM would become a real uncle to small business under a new administration-sponsored measure introduced by Senator Burnet R. Maybank (Dem., S. C.).

In line with the new White House strategy of seeking to allay business criticism of the Fair Deal, it would set up a special small business champion in the executive office of the President. Assisted by six dep-

Three things every maker of hollow cylindrical parts should know about TIMKEN® tubing

1. *Eliminates drilling, saves time and material*

You're half through before you start when you make cylindrical parts from Timken® seamless steel tubing instead of bar stock. Timken seamless tubing cuts time and cost because it eliminates drilling, reduces boring, saves scrap and permits faster machining speeds. Finish boring is often your first production step.

2. *Most economical size assured by our tube engineering service*

Our tube engineering service makes even greater savings possible because our engineers choose the most economical size tube for you . . . and it's guaranteed to clean up to exacting finished dimensions. This tube engineering service is recognized and proved. That's why 90% of Timken tubing is bought on this basis.

3. *Superior forged quality improves the finished product*

Timken seamless tubing is made by a process that is basically a forging operation. Red hot billets are forced over piercing points by rolls that work the steel with a kneading, spiral action, giving Timken tubes uniform, spiral grain flow and refined grain structure. And foot-a-second piercing stops heat loss, assures uniform quality from one end to the other. Why not get the complete story on Timken tubing from our Technical Staff? Also ask for a free copy of our informative, 68-page booklet, "Facilities and Products". Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

uties, the co-ordinator would formulate a small business program to be recommended by the President for approval by Congress.

His first duty would be the development of a definite criterion to determine what is an independent small-business enterprise, and to recommend to Congress the enactment of a clear definition of small business that would be uniformly interpreted by all executive agencies. Next, he would assist independent small-business enterprises to obtain a fair share of government contracts.

The Small Business Co-ordinator, as he would be known under the bill, would recommend legislative amendments under which:

1. RFC would grant small-business loans under a more liberal policy.

2. Section 13b of the Federal Reserve Act would be adapted to the present credit needs of independent small business.

3. The SEC Act and regulations would be adjusted to the problems of independent small business.

4. A government insurance system would be established to relieve independent small business of the financial hardships caused by shortage of dollars in foreign countries.

5. The federal income tax structure would be revamped to foster the growth of small business.

Identified as S. 2943, the bill is in the hands of the Senate Banking and Currency Committee.

Up To Date

A SURVEY of manufacturing establishments covering 1949 is being conducted by the Census Bureau under authority of an act of Congress.

The law requires every concern that receives a form to file a report covering its 1949 operations in each of its manufacturing establishments. The survey is not a complete enumeration like the Census of Manufactures: It covers only representative companies, chosen to make a sound estimate for total manufacturing activity.

The survey will bring up to date the broad statistics available through the Census of Manufactures that is taken every five years. (The next one is due to be taken in 1953.) If your company has been included in the current survey, it is a good indication that the Census Bureau considers your company essential to its purpose of getting a more up-to-date view of what's happening in different industries from year to year.

Brainstorms Pay Dividends

A MECHANIC at the Marine Corps Air Station, El Toro, Calif., started a practice of using ball bearings as drill stops. His idea prevents damage encountered with other types of stops in drilling aluminum aircraft sheathing and on other delicate work. Here's the way he did it: He bored a hole in a bearing that is slipped to the desired position on the drill bit. A setscrew locks the bearing in place.

Ideas like his are practical for private industry. And the Defense Department is working out many of them. Because of the manufacturing and repair operations being carried on at a large scale in government arsenals, Navy yards and other plants, a premium has been placed on the development of cost-saving ideas by employees. Financial rewards are given to shop workers contributing worthwhile ideas.

Here are some more dividend-paying brainstorms:

Some heavy machinery including a 62-ton rock crusher and three 39-ton cranes had to be moved from shipside to a defense plant in the San Francisco area. Under contract to a private company, the machinery was loaded, without any special blocking or bracing, on wide, low-bed trucks and hauled to its destination. Clearance had to be obtained from the highway authorities due to excessive height, weight and width.

At the Navy's Aviation Supply Office, Philadelphia, an employee developed a 10-foot platform which may be raised or lowered on a scaffolding mounted on a four-wheel truck. It gives ready access to the goods on high shelves and has proved especially valuable in taking inventory, reducing the hazard of accidents and eliminating the need for additional manpower for the task.

Color TV Bids To Be Heard

COMMERCIAL STATUS of color television is to be decided soon by the Federal Communications Commission, and interested parties will be given a chance to speak their pieces at a new series of hearings to begin Feb. 27.

The objective is to determine the needs of color television in relation to those for black and white television so new wave band allocations will not lead to future difficulties. Present allocations involve Channels 2-13 inclusive, and FCC's present problem is that incidental to opening up the UHF (ultra high frequency) bands.

Preceding the hearings, the commission will open its laboratory near Laurel, Md., Feb. 23-24 to further demonstrations of color television by Color Television Inc., Radio Corp. of America, and Columbia Broadcasting System Inc. These will be observed by the commission and its television engineering staff.

★★★★★★★★★★★CAPITAL COMPASS★★★★★★★★★★★

BEFORE getting into excise tax reductions, the Ways & Means Committee is looking for a way to make up for contemplated loss of millions in revenue. The committe is studying means of closing present tax loopholes—particularly the possibility of taxing present tax-exempts . . .

Outlook for construction of additional veterans' hospitals is blurred by Defense Secretary Johnson's order inactivating 18 military hospitals. Some of the hospitals that can be used by the VA will be assigned to that outfit. . . The Air Force is thinking of entrusting its pilots and airframe and engine mechanics to private contractors. If you're interested, contact the Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O. . . .

You can get a list of publications made available for sale by the Atomic Energy Commission in the last quarter of 1949 by writing the commission's Technical Information Division, Oak Ridge, Tenn. Prices for the various titles range from 5 to 45 cents . . . Copies of a new seven-color, 44 x 64-inch map showing "Principal Electric Facilities in the United States" may be had for $6 from Publications Section, Federal Power Commission, Washington 25. . . .

"No comment," say spokesmen of the Research & Development Board about a Pittsburgh report that Dr. Robert F. Mehl, Carnegie Institute of Technology, has been appointed chairman of the board's committee on metallurgy . . . With Senate approval Maj. Gen. William P. T. Hill was reappointed to another two-year term as quartermaster general, Marine Corps. . . . Robert H. Ridgeway, after four years with Union Carbide & Carbon Corp., returned to the government as chief, Ferrous Metals & Alloys Branch, Minerals Division, Bureau of Mines.

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World Industry Watches for Outcome in British General Election

U. S. exports may be benefited if Britons elect Conservative government

HOW'S your export business? It may improve if the Conservatives win the British elections Feb. 23.

Not that the Conservatives will drop the bars on present U. S. buying restrictions if they win. They wouldn't, even if they wanted to. But the Conservatives would be willing to co-operate more than the Laborites in permitting trade reforms urged for ERP countries by ECA Administrator Paul Hoffman. Because the British have refused to go along on a customs union, international currency and lower tariffs, other European nations couldn't act either. Reforms would spur inter-European trade and eventually U. S. traffic with the revitalized ERP countries. A Conservative government would loosen up in these matters and also in trade restrictions on non-European sterling areas—particularly—the Middle East.

Export Outlook Poor—The export outlook for American metalworking products is still quite poor although devaluation has now been in effect nearly five months. Many exporters think two more years will be required before new, stable world trade patterns can be re-established. The war broke nearly all patterns; devaluation added to the chaos.

What figures are available show that U. S. exports were valued at $904 million in September, $849 million in October and $836 million in November. Hardest hit have been agricultural products—off as much as 33 per cent since the autumn currency manipulations. Metalworking dollar exports now average 20 to 25 per cent less than the pre-devaluation level. Aircraft shipments abroad are holding up, but automotive exports are off 18 per cent, copper and copper products 43 per cent, iron and steel products 35 per cent, and machinery 14 per cent. Manufacturers of high priority machinery—electrical and construction equipment primarily—are still doing well.

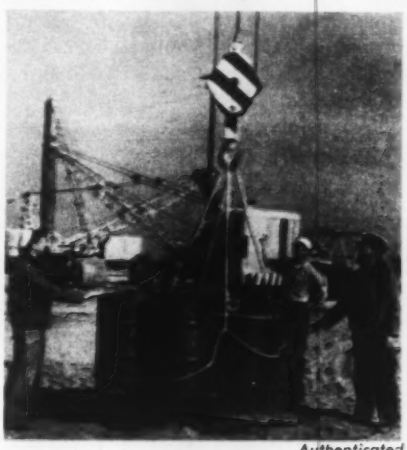
Canadian Exports Off—For the first nine months of 1949, American exports to Canada averaged $167 million monthly. Since devaluation they have averaged only $145 million each month. Exports to Britain, France, Germany and Italy for the first nine months averaged $216.6 million monthly. Since devaluation American exports to these countries have slipped to $172 million each month. Exports to Red China skidded to $280,000 in October. They were averaging $40 million monthly a year ago. If China develops a Tito-like attitude toward Russia, that area may again become a good market. Two other promising markets in Asia are India and Japan, but thus far dollar shortages hamstring trade.

Another factor in America's export picture is growing competition from Europeans, particularly the British. Britain especially wants the juicy Canadian plum and has already increased its sales there of steel, machine tools, automotive equipment and scientific instruments.

New Line To Aid Exporters

A new world-wide ocean freight service from all principal Gulf ports has started operations with organization of Gulf Shipping Lines.

The service, representing independent steamship lines on a non-conference basis, will schedule regular sailings from Houston, Galveston, Brownsville, Corpus Christi, Beaumont, Port Arthur, Lake Charles, New Orleans and Mobile to ports in the West Indies, the Persian Gulf and the Orient. "Gulf Shipping Lines will improve opportunities for mid-western and southern manufacturers to engage in foreign trade," says A. D. Lee, president of the Houston company.



Authenticated

• SIMPLE, INGENIOUS: This method of securing and moving barrels, drums and boxes was learned by a Seabee who was a Japanese prisoner of war for three years. The sling can be used to handle as many as eight or as few as two bulky articles. Use of the sling reduces accidents in handling drums and barrels. Picture shows the self tightening of the sling as the slack is taken up when the load is hoisted

Western Europeans—all must follow U. K. somewhat—look for government style changes

ONE WOMAN has this to say about the plunging neckline in ladies' apparel: "I catch more colds this way, but what can I do? It's the latest style."

Western Europeans have their eyes on that style-setter, Great Britain, to see if the trends will be changed at the Feb. 23 elections.

If they are, a conflict will be resolved in Western Germany that now has economic planning at a standstill. Currently, Britain and German labor favor a mildly socialist state. Americans and German management favor capitalism.

Belgium-Luxemburg — uncomfortably playing the role of the lone free-enterprise state in Western Europe—expects a psychological impetus to its economic performance if it gets warmer support from Britain.

French nationalization plans may be shelved permanently if the British Conservatives win. Public ownership schemes for steel and other industries could be reintroduced by French Socialists if the English climate of opinion remains to the left.

Production and Politics in U. K.

Industrial production records set in the United Kingdom since the war figure in the political campaign. Labor says, "Our policies helped." Conservatives say, "Output highs were set in spite of the government."

Embarrassing to the Conservatives is the fact that in 1949 alltime output records were set in steel, automobiles, machine tools, materials handling equipment, special production machinery and railroad equipment. Only segments of the economy seriously hit were shipbuilding and iron foundries.

In the U. S. this political axiom holds: When business is good, election chances are good for the party in power. Will this be true in Britain?

Ruhr Planning Pends

The pending British elections are partly responsible for the suspended state of economic planning in Western Germany. Why make plans approved now by a Laborite commissioner that may be vetoed later by a Conservative?

The most pressing problem in Germany now is unemployment. About 1,780,000 are jobless in the country because of wholesale immigration,

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unrepaired industrial damage and economic dislocations caused by the division of Germany. Unemployment is the most serious in heavy construction and railway car building.

The long-pending scheme to reorganize the steel industry is still hanging fire. The conflict now is centered on the division of power for the German groups that are to manage the steel plants and the Ruhr Authority that is to be made up of Allied members.

Another area of conflict is in banking. The Germans want tight money to discourage inflation and attract foreign investment funds. The British favor easy money to cut down unemployment.

West Germany's steel output climbed in January almost to the top production level permitted by the Allies. Output, greatest for one month since the war, was 900,600 net tons. This is at a rate of 10,807,200 tons a year. The permitted level is 11.1 million tons. The industry will be producing at the full rate this month or next.

Pig iron production also hit a postwar high of 697,732 tons in January, compared with 633,024 tons in December.

Belux Eyes Britain

To keep to its free-enterprise mode of living is becoming increasingly difficult for Belgium-Luxemburg, particularly since it's in an economic slump. A return to at least a modified form of this style in Britain would help the union which is closely tied to the U. K.

A slight improvement has occurred in Belux iron and steel markets. Prices are steadier than at any time since last November. Exports rose from a low of 219,340 tons in November—the poorest month since February, 1948—to 257,000 tons in December. Belux ingot production in 1949 totaled 6,659,791 tons, compared with 6,100,428 tons in 1948.

Nationalization in France?

The now dormant plans to nationalize the French steel industry may come to life if labor wins in Britain. Already the Saar mills are under semipublic control, and the new Usinor group which is expanding at Montataire and Denain is getting Marshall and French government financial aid.

The continuous cold-rolling mill installed at Montataire has begun partial operations. Full production is expected by the end of 1950, when a new continuous coil mill is finished at Denain. The Denain works of Usinor has received 16 traveling cranes and three reheating furnaces from the dismantled Hermann Goering plant in Brunswick.

Production of iron and steel in France last year totaled 10,036,400 net tons, compared with 7,958,500 tons in 1948 and 10,682,100 tons in 1929. In November, France exported 265,000 tons of steel products, an all-time high.

The 750 French gray iron foundries are producing 990,000 tons per year. Labor productivity is only about half what it is in the U. S.

Construction Program for Japan

PLANS for a $100 million construction program in Japan, financed jointly by American and Japanese capital, are announced in Los Angeles, headquarters of Wurdeman & Becket, architectural engineers who will direct the project.

Under sponsorship of the Japan Development Corp., the program calls for a series of hotels and trade and cultural centers designed to restore Nippon to its oldtime role as a tourist Mecca. First unit is to be a 1000-room hotel constructed on the outer grounds of the Imperial Palace in Tokyo—land deeded to the Japan Development Corp. by the Japanese government "as a most decisive step toward self-support." This will be the largest hotel ever built in the Orient.

Future structures planned for the Tokyo center include three office buildings, department store, two theatres, a 200-unit apartment, an art gallery, and a museum. Other phases of the building program provide for an additional 13 hotels in leading resort areas as well as extensive trade centers in Osaka, Yokohama, and Kobe.

Wurdeman & Becket say the program is part of the long-range plan to provide tourist accommodations in the islands to stimulate local building industries and to provide commercial facilities needed in the reconstruction of Japan's war-shattered economy.

This will supplement present measures of the U. S. economic stabilization plan, and "help lighten the burden on U. S. taxpayers of supporting the Japanese recovery program."

Financed entirely by private capital, with from 20 to 50 per cent American funds, the sponsoring group includes prominent Japanese and American figures.

Among these are Shinnosuke Komatsu, Japanese industrialist, Conrad Hilton, head of the international Hilton hotel chain, and George Killion, president of American President Lines Ltd.

River Gets Bridgelifting

Kinky Cuyahoga to be made more navigable by Truman-Hobbes Act

A NAVIGATION-improvement project has just begun in Cleveland which, if successful, will help river and harbor development—and industry—all over the nation.

Cleveland's kinky Cuyahoga river is getting a bridge-lifting. With the aid of the obscure Truman-Hobbes Act, the federal government is cooperating with the city, railroads and river-front property owners to improve navigation and aid steel mills and steel users. The 6 million tons of iron ore annually freighted up the Cuyahoga can be carried faster when the six-year, $21.9 million program is completed. First project in the scheme got underway in January—raising railroad bridge No. 25. Contracts will be ready this month for a similar job on railroad bridge No. 8.

The Cuyahoga is a test case. If it works, similar government-industry co-operation can be expected at other navigational trouble points around the country. The Truman-Hobbes measure, passed when the President was a senator, makes co-operation possible (see STEEL, Aug. 29, 1949, p. 35). The law, permitting government aid in rebuilding bridges deemed a hazard to navigation, was enacted originally to modernize a bridge used by the Southern Railway in Alabama. Although the legislation was passed, it was never implemented by President Roosevelt. Only now is Mr. Truman giving it administrative action.

Cleveland planners believe speedier river traffic will enable steel companies to expand. This in turn should attract metalworking firms that seek closer steel supplies but that, in the case of Cleveland, won't move where steel capacity is inadequate for additional demand.

Republic's Cleveland Plants Win

A LESSON that bears repeating—training in industrial safety pays off—is again demonstrated at Republic Steel Corp.'s Cleveland District steel plant and strip mill.

Completion of the 1949 safety campaign shows those plants in first place in the company's annual steel plant safety contest. The award caps a steady decline in the frequency and severity of accidents since 1945.

Now every supervisor in the plant is required to take a ten-hour course in safety. Regular supervisory safety

meetings are held for the supers and the men on the job. Last year more than 15,000 group safety meetings were held; total attendance was over 200,000, the equivalent of each worker attending 20 to 25 meetings in the year.

Net result: Accident severity rate at the plant last year was held to 0.55 as against 1.28 in all Republic plants. The 1.28 rate in itself is good: Republic says it is well below the steel industry's average.

Production Show Cancelled

NATIONAL Production Exposition, originally scheduled for Apr. 4-8 in Chicago, has been canceled by the sponsoring group, Chicago Technical Societies Council. A late start and conditions in some supporting industries dictated the cancellation.

Want To Try for $250?

JUDGES for Cooper Alloys Foundry Co.'s essay contest on "Applications for Cast Stainless Steel in the Chemical Industry" have been chosen. They are: Edmond C. Fetter, managing editor, *Chemical Engineering*; Ted C. Dumond, managing editor, *Materials & Methods*; and Dan W. Talbott, vice president and general manager, Cooper Alloy Foundry Co.

The contest which opened last October is scheduled to close May 1, 1950.

It offers cash awards totaling $500 for the best papers dealing with applications for stainless steel fittings, valves and engineered castings in the chemical industry. Full details are available from the Contest Editor, Cooper Alloy Foundry Co., Hillside, N. J.

Eutectic Offers Training Series

EUTECTIC Plant and Welding Institute, Flushing, L. I., N. Y., starts a new series of training classes this week, Eutectic Welding Alloys Corp. announces. Not for beginners, the training course consists of five days of intensive training in practical arc and torch welding with Eutectic low temperature welding alloys and a program of slides and film, lectures by expert welders and a background of welding metallurgy.

Life With Grandma Taught A Neat Trick

Authenticated

REMINISCENT of Grandma's cookie cutter is an economical method of making die-cut metal parts now in use at Boeing Airplane Co.'s Seattle plant.

It puts to use two old, long-proved tools: The household cutter and the steel rule used by printers to cut or perforate paper while a printing impression is made. Technically called a "dinking die," the new cutter is made quickly and inexpensively from plywood, thin strips of a special type of steel and a neoprene-cork pad. Sharp metal strips cut metal into desired shapes when pressure is exerted from above by a hydraulic press.

This is how the trick is turned: The die is placed face up on the bed of the press; a sheet of metal is placed over the die; the solid steel face of the press is forced down to make a clean stamping. The neoprene-cork center blanket serves as a pushout for the cut piece, allowing easy removal of finished parts from the die.

CALENDAR OF MEETINGS

Feb. 13-14, Society of the Plastics Industry (Canada): Canadian annual meeting, Royal York Hotel, Toronto, Ont. The Canadian segment of the society is associated with the American society whose headquarters are at 295 Madison Ave., New York.

Feb. 13-15, American Management Association: Conference on employee relations and personnel administration, Palmer House, Chicago. Association headquarters are at 330 W. 42nd St., New York.

Feb. 14-16, Purchasing Agents Association of Chicago: Products show, Hotel Sherman, Chicago. Association headquarters are at 134 N. La Salle St., Chicago.

Feb. 15-16, American Hot Dip Galvanizers Association Inc.: Annual meeting, Netherland Plaza Hotel, Cincinnati. Association headquarters are at 2311 First National Bank Bldg., Pittsburgh.

Feb. 15-17, American Chemical Society: Pittsburgh conference on analytical chemistry and applied spectroscopy. Hotel William Penn, Pittsburgh. Society headquarters are at 60 E. 42nd St., New York.

Feb. 20-21, American Material Handling Society, Indianapolis Chapter: Materials handling conference sponsored jointly with Purdue University, at Lafayette, Ind.

Feb. 24, Eastern States Blast Furnace and Coke Oven Association: Meeting, Hotel William Penn, Pittsburgh.

Feb. 24, Malleable Founders' Society: Western sectional meeting, Drake Hotel, Chicago. Society headquarters are in the Union Commerce Bldg., Cleveland.

Feb. 27-Mar. 3, American Society for Testing Materials: Committee week and spring meeting, Hotel William Penn, Pittsburgh. Society headquarters are at 1916 Race St., Philadelphia.

Feb. 28-Mar. 1, Chamber of Commerce of the United States: National marketing conference, Hotel Book-Cadillac, Detroit. Chamber headquarters are at 1615 H St., Washington.

Mar. 2-4, Society of the Plastics Industry, Pacific Coast Section: Annual conference, Hotel Del Coronado, San Diego, Calif. Society headquarters are at 295 Madison Ave., New York.

Mar. 3, Malleable Founders' Society: Eastern sectional meeting, Hotel Commodore, New York. Society headquarters are in the Union Commerce Bldg., Cleveland.

Mar. 6-10, American Road Builders' Association: 47th annual meeting, Netherland Plaza Hotel, Cincinnati. Association headquarters are in the International Bldg., Washington.

Mar. 8, American Society for Testing Materials, Philadelphia District: Meeting on air pollution, Philadelphia. Society headquarters are at 1916 Race St., Philadelphia.

Mar. 10-11, American Foundrymen's Society, Ohio Chapters: Regional conference, Cincinnati. Society headquarters are at 222 W. Adams St., Chicago.

Mar. 14-16, Society of Automotive Engineers: Passenger car, body and production meeting, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Mar. 16-17, Pressed Metal Institute: Technical symposium on cold extrusion of steel, Hotel Carter, Cleveland. Registration fee is $5 for anyone interested. Institute headquarters are at 13210 Shaker Sq., Cleveland.

Mar. 20-25, Concrete Reinforcing Steel Institute: Meeting, at The Shamrock, Houston. Institute headquarters are at 38 S. Dearborn St., Chicago.

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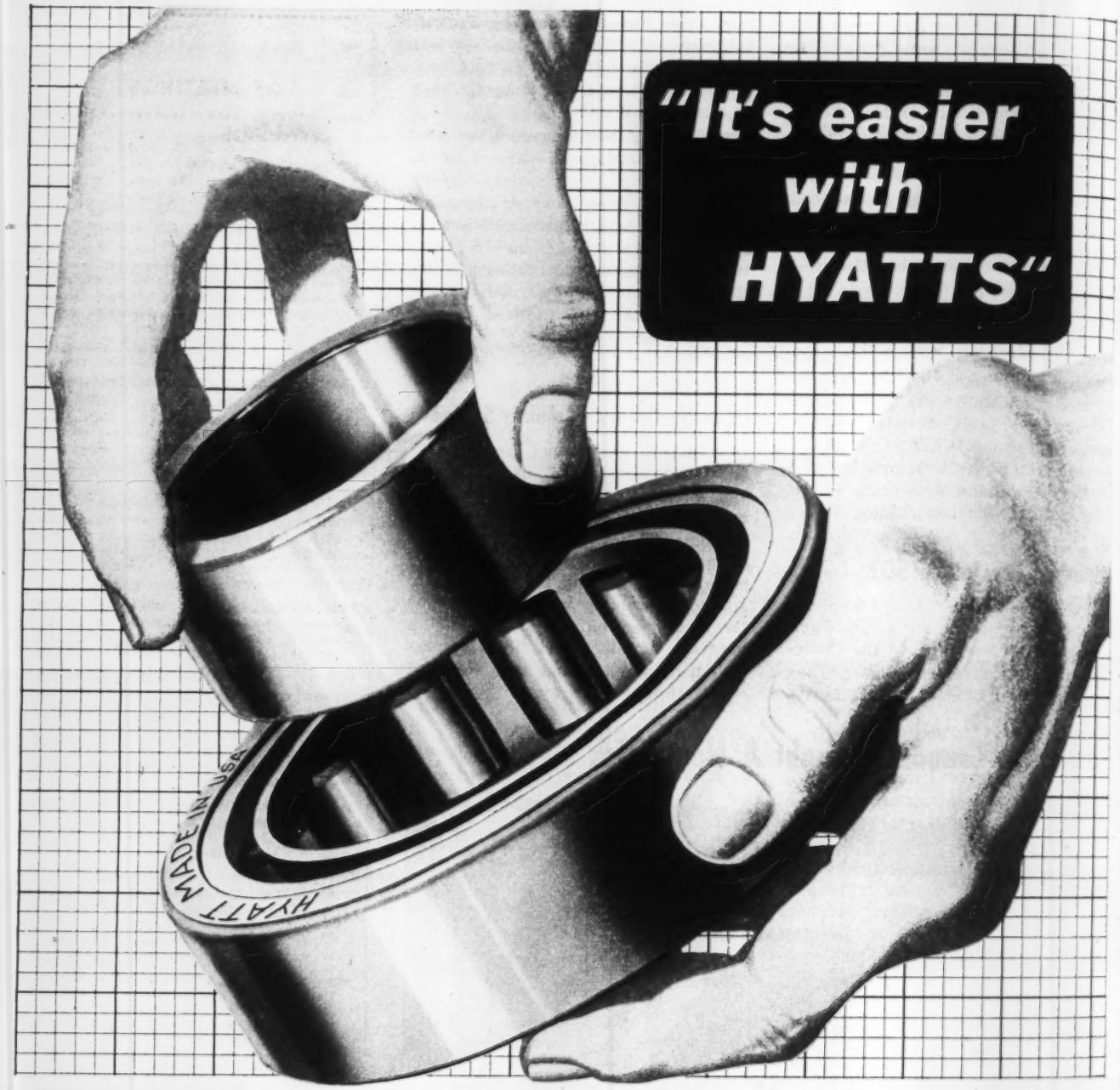

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Any inner race or outer race will fit any roller assembly of the same piece number. This eliminates selective fitting and permits you to assemble the separable bearing parts in different machine elements and then bring the elements together, fully confident that all bearing parts will match.

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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

January sales by automakers keep pace with high production rate. Buick and Oldsmobile set new records. Ford aiming at best first half in history, on six-day week

DETROIT

CONFOUNDING most of the experts who, while admitting most all production planning for the first part of this year was geared to a record high level, were not so ready to acknowledge or forecast that sales would keep pace, several manufacturers have reported their tallies for January sales topped anything yet realized.

Buick deliveries set an alltime high, although a normal January sales pattern, in 1940 for example, accounted for 7.6 per cent of the year's total.

Oldsmobile dealers sold 26,153 cars last month, or 37 per cent more than a year ago and even topping the first month of 1941 when sales were booming. Beyond that, the last ten days of the month were the best for any ten-day period since the final period of May, 1941.

The breakdown of Olds figures shows 54 per cent in the intermediate 88 series, 24 per cent in the larger 98 and 22 per cent in the least expensive 76 model, reflecting no particular desire on the part of their customers to specify low-price jobs. Explanation probably is that most purchasers want the new V-8 high-compression engine fitted to the larger models. Olds production, incidentally, was only 4381 units higher than sales, suggesting no serious backing up of cars in dealers' hands. This output was second only to last August which had two more working days than January.

Chevrolet Hits New High—Chevrolet hit a new peak last month, with 113,602 cars and 32,249 trucks, more than double the same month of 1949, despite the fact truck production was down about 3500. Passenger car assemblies were better than double the first two months of last year.

All General Motors divisions in January built 275,852 units, against 149,027 a year ago. This put the month about on a par with last June, although 15,000 short of the August peak.

An interesting aspect of production figures is the sharp rise in passenger car assemblies in Canada. GM assembled 6924 units there in January, against only 59 a year ago. Truck building was up from 2139 to 2824.

Ford reports all operations at capacity and a good start made toward the greatest six months in company history. January assemblies were 148,393, and the best single day since the end of the war was achieved Jan. 31 when 7220 vehicles were produced. The Ford goal for the first half is one million with daily pace upped to 8000 by Apr. 1. To meet requirements of current scheduling, considerable overtime and some six-day weekly operations are in effect, but vary from week to week in manufacturing and assembling. Effect of a continuing shortage of coal on venders' steel supplies is a concern. Rouge coal stocks are ample for the time being, since coal piles in the Detroit area are built up during the navigation season so that a minimum tonnage will need to be brought in by rail during the winter. Other industrial areas are not so fortunately fixed.

Ford on Six-Day Week—Saturday work was instituted week before last at the Rouge automotive manufacturing operations, with nearly 15,000 hourly-rated employees on the job in seven divisions. This arrangement will continue at least through May. Most final assembly lines are operating on a 9-hour day, and 14 plants are scheduled for 5 hours overtime weekly this month. Of these, the Chester, Pa., and Chicago plants are scheduled for one 8-hour Saturday of production. The Highland Park, Mich., and Long Beach, Calif., plants are slated for 10 extra hours each week during the month. Ford steel operations here are being pushed to the limit, and January tonnage was a new record for open hearths, approximately 103,500 tons of ingots, not counting 1300 tons of electric furnace ingots.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	620,000*	445,092
February		443,734
March		543,711
April		569,728
May		508,101
June		623,689
July		604,351
August		678,092
September		657,078
October		601,021
November		474,726
December		378,834
Total		6,528,157

Weekly Estimates

Week Ended	1950	1949
Jan. 21	158,432	113,820
Jan. 28	141,036	116,471
Feb. 4	127,656	102,981
Feb. 11	125,000	108,911

Estimates by Ward's Automotive Reports

* Preliminary.

Chrysler Loss: $108 Million

CHRYSLER, of course, continues the exception to the roseate production picture, already having lost an estimated 90,000 cars and trucks since its plants were struck Jan. 25. Figuring an average wholesale value of perhaps $1200 each, this amounts to a staggering jolt of $108 million which, for all practical purposes, will never be recovered. It is a high price to pay for an answer to the question of whether or not the UAW-CIO has the power to drive a better bargain on pensions than it has won thus far anywhere. In a sense, Chrysler is carrying the ball for other manufacturers who eventually will be pushed into the pension pot.

Referring to union demands that flat payments of 10 cents per hour per employee be paid into a pension trust fund, in which the UAW would have joint control, the company soundly points out: "Any employer, successful enough to make pension commitments capable of fulfillment, is able to earn a greater return on capital invested in his regular operations than from funds deposited in a special trust fund. That's for sure. And, too, shocking as it may be, if all pension plans required all company pension payments to be put in a special trust fund—and automatically reinvested—it wouldn't be long before all businesses in America would be owned by the pension trust funds. This would destroy the vitality of American business and would remove the incentive for individual enterprise."

These are sobering thoughts for employers, government and working people alike, who are floundering

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around in the current mess over industrial pensions, social security changes and strikes that are difficult to justify.

More Prices Trimmed

PRICE cuts by Studebaker ranging from $86 to $141 on all passenger car models, effective Feb. 1, were followed by similar action on the part of Hudson which trimmed its 1950 Super and Commodore models last week by $86-$170 from 1949 levels, and touched off speculation over whether the action may have sprung from a desire to sharpen up competitive positions.

Stated reasons for the price reductions were production economies brought about by expanded and modernized plant facilities, and by refinements in quality, styling and engineering. The action leaves Chrysler as the only company which has not reduced passenger car prices in the 1949-50 period, and any action by that producer will have to be deferred until the current strike impasse is broken.

Hudson Presents New Models

HUDSON'S new models present a new frontal line, patterned after its Pacemaker series introduced last fall. A four-louvered grille has diagonal twin struts which form a triangle with an illuminated emblem at the top, centered in the top grille bar. Parking lamps are integral with, and form the outside tips of the lowest grille bar. The embossed "speed line" running the full length of the body side panels is unchanged, but a new stainless steel strip has been installed several inches below the "crease" and paralleling it to serve as a protective antiscuff rail for the body side. The former wide bright metal molding extending along the lower edge of the body has been subdued by merely outlining the area with stainless steel strip, leaving the rest of the metal painted. Rear bumpers are bolted directly to the frame instead of being mounted on brackets, for added strength.

Appearance from the rear has been altered by enlarging the curved window area 43.5 per cent and installing a center dividing strip. Curvature of the glass used in the windshield and the angle of mounting are designed to eliminate reflections from both front and rear, a source of complaints previously.

Instrument panel has been completely redesigned to provide more knee-room for passengers in the front seat.

Lower edge on the right side curves upward an inch or so. The panel is finished in dark walnut tone, as are window garnish moldings. Base metal on the face of the instrument panel is finished in a frosted chrome effect, minimizing any possible glare from reflections.

No basic changes have been made in Hudson bodies or chassis. The 6-cylinder engine has been increased slightly in horsepower, now being rated at 123, against 128 horsepower for the eight. Both are of the L-head design, compression ratio of the six being 7.2 to 1 with aluminum head.

A new cooling system of the closed pressure type is introduced this year, following the practice of a number of other manufacturers. Operating at 7-lb pressure, the system raises the boiling point of the coolant more than 20 degrees and prevents overheating in slow-moving traffic. Improvements in the cellular-tubular radiator, coupled with a new water pump seal, are said to contribute to better engine cooling.

Both series of cars are available with either six or eight-cylinder engine. Both have wheelbase of 124 inches, with overall length of 208 inches. Body types include club coupes, broughams, sedans and convertible broughams, in 15 color options.

1950 HUDSON CUSTOM COMMODORE
. . . frontal line patterned after Pacemaker series

Continental Orders Up

ALTHOUGH consolidated net earnings of Continental Motors for the fiscal year ended last Oct. 31 were down from $3.5 million for the year previous to $1.8 million, representing a 30 per cent drop in sales, orders have increased sharply since the first of the year and prospects point to an upturn in employment by spring.

Schedules call for about 33,000 engines to be shipped in March, or 30 per cent above average monthly shipments last year and 25 per cent under the 1948 average. Output last year is classified into 43 per cent for the agricultural industry, 21 per cent for replacement parts and machine products, and 10 per cent for airplane, marine and military customers. Final shipments on an $18 million tank engine contract for the Ordnance Department will be made during the present year and negotiations are under way for production of a similar but smaller engine for the Army.

Outgrows Production Facilities

WHEEL, coil, spring and running board production at the Ford plant in Hamilton, O., will be moved to larger facilities at Monroe, Mich., starting in April and ending probably in September. The move is being planned in stages so that employees who elect to work at Monroe will not all leave Hamilton at the same time. Some opportunities will be available for certain classifications of Hamilton employees at the new Cincinnati automatic transmission plant which Ford now is building.

Ford Produces Movie

THE HOLLYWOOD touch is applied to production of a full-color documentary film, "The Human Bridge," telling the dramatic story of the creative talents and skills of 140,000 Ford Motor Co. employees, with the mood set in large measure by an original musical score played by the Los Angeles Philharmonic orchestra. A nine-month 10,000 mile filming schedule ranged from coast to produce the 30-minute movie.

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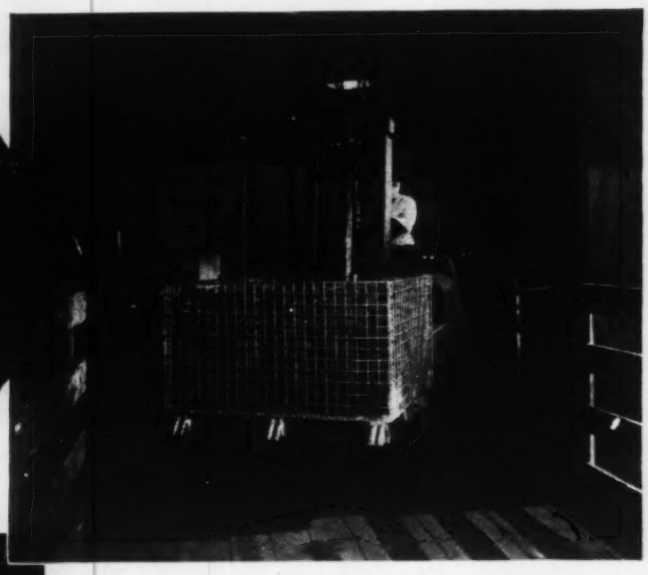
Pittsburgh CARGOTAINERS Speed Operations and Reduce Handling Costs



Above, CARGOTAINER being loaded into delivery truck at vendors holds 345 castings—more than 2700 lbs. Previously only 88 castings weighing 704 lbs. were handled in odd size drums by one man in the same amount of time. Uniform size of CARGOTAINERS allows easy stacking after castings are loaded—also affords more efficient handling from inspection through shipping.

CARGOTAINERS in above photograph are received at assembly plant from vendor—are easily unloaded directly from truck to storage space. Note ease of stacking and minimum of storage space required, also the variety of parts that pack easily in CARGOTAINERS.

At right, CARGOTAINERS again save additional handling time and costs at end of machining process on castings. Parts are easily packed back into CARGOTAINERS and moved to storage to await final assembly. The awkward gap between vendor and assembly plant is easily bridged with versatile, maneuverable CARGOTAINERS.

For further information on Pittsburgh CARGOTAINERS, write Pittsburgh Steel Products Company, Department S, Grant Building, Pittsburgh 30, Pa.

CARGOTAINERS *by* **Pittsburgh Steel Products Company**
Subsidiary of
Pittsburgh Steel Company

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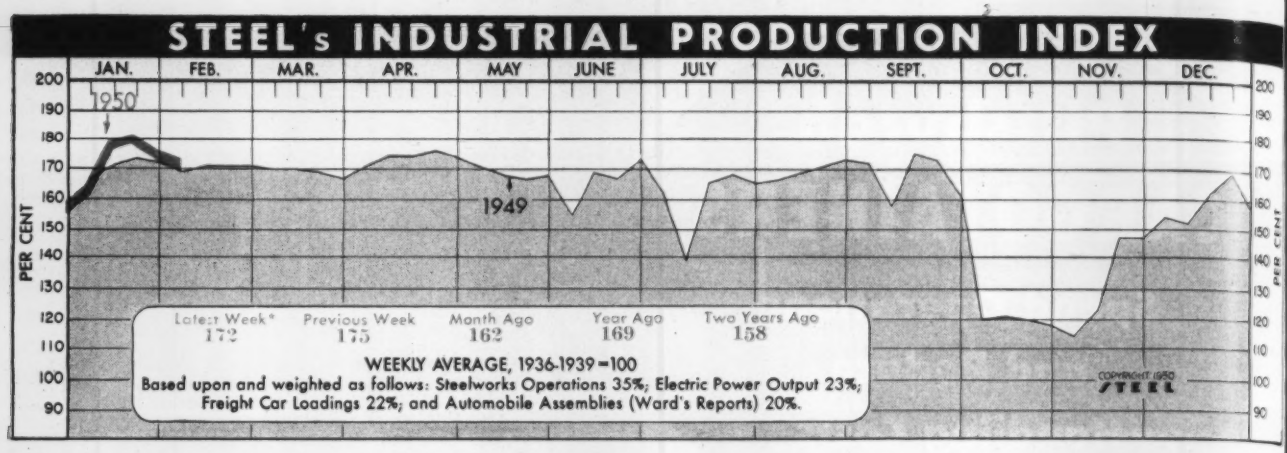
STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1950
1949
PER CENT
Latest Week* 172
Previous Week 175
Month Ago 162
Year Ago 169
Two Years Ago 158
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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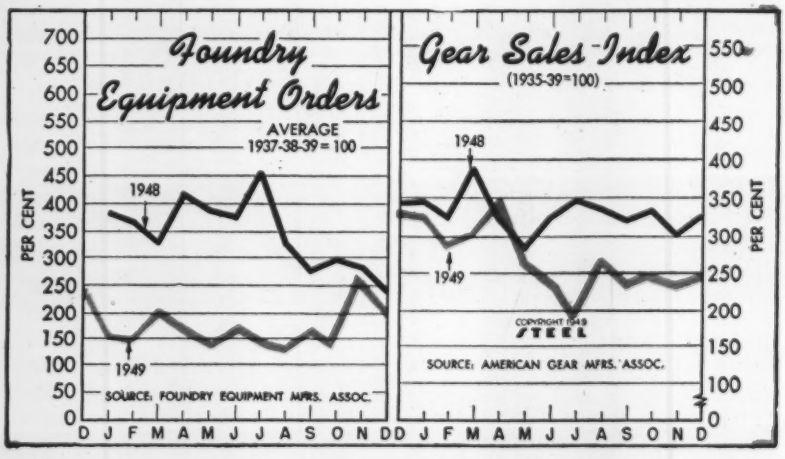
* Week ended Feb. 4 (preliminary).

Steel Shipments

(Net Tons)

	1949	1948	1947
Jan.	5,788,632	5,410,438	5,061,333
Feb.	5,519,938	5,046,115	4,626,424
Mar.	6,305,681	5,978,551	5,304,415
Apr.	5,596,786	5,096,161	5,445,993
May	5,234,862	5,321,375	5,442,343
June	5,177,259	5,476,774	5,263,711
July	4,534,855	5,229,880	4,974,566
Aug.	4,918,314	5,329,060	5,278,223
Sept.	5,236,196	5,511,474	5,118,839
Oct.	935,037	5,952,008	5,681,597
Nov.	3,296,809	5,732,256	5,216,990
Dec.	.....	6,056,282	5,613,036


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
1949
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
(1935-39=100)
1948
1949
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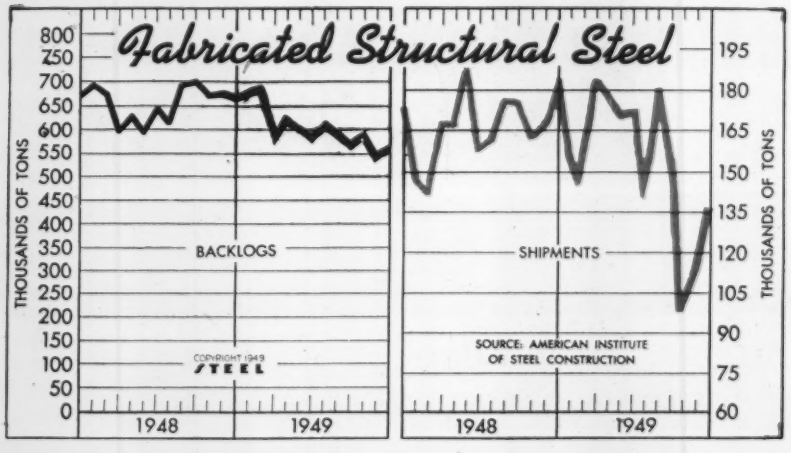
SOURCE: AMERICAN GEAR MFRS. ASSOC.
D J F M A M J J A S O N D D J F M A M J J A S O N D

	Foundry Equipment Orders* Index (1937-1939=100) 1949	1948	Gear Sales Index (1935-1939=100) 1949	1948
Jan.	149.9	380.9	320.7	346.8
Feb.	144.4	367.3	282.3	324.4
Mar.	190.8	326.2	299.1	389.8
Apr.	172.0	412.0	339.0	320.9
May	121.9	388.5	250.1	283.6
June	164.9	376.8	227.8	324.1
July	146.6	456.3	193.1	348.4
Aug.	127.1	324.7	262.0	335.6
Sept.	166.6	273.5	224.9	320.4
Oct.	133.5	296.0	242.3	333.3
Nov.	270.4	284.4	230.7	309.0
Dec.	201.0	243.7	242.8	325.9

* By foundry trades only.



Fabricated Structural Steel

(000 Tons)

	Shipments 1949	1948	1947	Backlogs 1949	1948	1947
Jan.	152.7	146.4	140.6	675	692	661
Feb.	145.9	141.6	136.1	683	673	656
Mar.	185.9	167.0	137.8	582	597	614
Apr.	179.2	166.7	157.4	628	630	632
May	171.1	186.9	155.0	599	593	628
June	172.3	157.1	151.9	583	647	634
July	148.0	160.8	169.9	605	613	661
Aug.	183.9	176.3	158.0	583	691	639
Sept.	162.1	175.0	164.3	562	698	648
Oct.	99.8*	164.0	196.1	584	669	649
Nov.	117.2*	169.8	175.0	527	673	645
Dec.	135.5	182.4	173.0	555	670	671
Total	1,853.5	1,993.9	1,915.1			

* Revised.

The Business Trend

THE HEALTHY glow in the business picture is fading as labor unrest grows and fans out to affect allied industries. Demand is high for almost all metalworking products; some industries' prospects are the best in several months. The pentup demand resulting from the steel strike has not yet been satisfied but operations in the immediate future hinge on the outcome of the coal controversy.

In the week ended Feb. 4 STEEL's industrial production index slipped to a preliminary 172 per cent of the 1936-1939 average, 3 points below the mark for the preceding week and 8 points lower than two weeks ago. Most of the decline is traceable to the production halt at Chrysler.

STEEL—Output of steel for ingots and castings is easing from the level for the first four weeks of this year. In the week ended Feb. 4 the steelmaking rate was unchanged from the preceding week at 94 per cent of capacity. Last week's drop resulted from dwindling coal supplies. More blast furnaces are being taken out of production and electric furnace operations either have been cut by electric power rationing or face the prospect of being trimmed.

AUTOMOBILES—The long-expected postwar readjustment in automobiles may be nearer than you think. Auto industry executives are playing their cards close to the vest but their actions indicate they are aware of what is shaping up. Not only did all companies hold the price line when steel prices increased but a couple of independents have whittled their prices. The Big Three have thus far stood pat on prices but their products are in greatest demand. Production continues at a rapid pace. Even with Chrysler shut down—it accounts for one-fifth of the industry's production — 127,656 vehicles were produced in the week ended Feb. 4. The decline from the preceding week's total of 141,036 passenger cars and trucks is slightly smaller than Chrysler's production in its two work-days that week.

COAL—Dwindling coal stockpiles are more than just a topic of conversation. Bituminous coal stocks faded to 32 days' supply on Jan. 1 from 37 days' supply a month earlier. Stocks last week were estimated at under 20 days. Production which was slightly in excess of 7 million tons per week in January did not keep up with consumption. Coal hauling railroads report their loadings are no more than a trickle and the railroads have pared their runs using coal burning engines.

CONSTRUCTION—Building prospects look bright except in commercial building. The decline in commercial construction means less business for many metalworking companies. Contracts awarded for building and heavy engineering works in the 37 states east of the Rocky mountains in January bear out this prediction. Although the total for the first month of this year at $730,855,000 was 51 per cent higher than in the like month last year, there was a sharp decline in commercial building. Residential contract volume gained 116 per cent over January a year ago.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	94.0	94.0	93.5	100.0
	Electric Power Distributed (million kilowatt hours)	6,062	5,972	5,695	5,778
	Bituminous Coal Production (daily av.—1000 tons)	1,250	1,210	1,042	1,747
	Petroleum Production (daily av.—1000 bbl)	4,945	4,956	4,926	5,407
	Construction Volume (ENR—Unit $1,000,000)	$160.7	$216.4	$323.4	$209.7
	Automobile and Truck Output (Ward's—number units)	127,656	141,036	116,768	102,981
	*Dates on request. †1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	617†	636	507	682
	Business Failures (Dun & Bradstreet, number)	199	232	161	145
	Money in Circulation (in millions of dollars)‡	$26,928	$26,913	$27,551	$27,556
	Department Store Sales (changes from like wk. a yr. ago)‡	+2%	none	−4%	−7%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$13,278	$13,556	$14,292	$13,913
	Federal Gross Debt (billions)	$256.8	$256.8	$256.9	$252.6
	Bond Volume, NYSE (millions)	$22.0	$21.5	$28.7	$17.7
	Stocks Sales, NYSE (thousands of shares)	10,109	7,435	9,039	4,686
	Loans and Investments (billions)†	$67.8	$67.7	$67.0	$62.8
	United States Gov't. Obligations Held (millions)†	$38,077	$38,131	$37,469	$33,411
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.13	156.13	156.13	155.05
	STEEL's Nonferrous Metal Composite‡	160.1	160.1	161.5	232.6
	All Commodities†	151.1	150.7	150.6	159.3
	Metals and Metal Products†	169.3	169.3	169.5	175.5
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

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Rheem Buys Equipment

Sale of Wheeling Steel's Portsmouth machinery includes inventory of finished material

RHEEM MFG. CO., a major producer of heavy home appliances and steel shipping containers for the oil, chemical and food industries bought the equipment and inventory of Wheeling Steel Corp.'s range boiler and tank plant at Portsmouth, O.

Rheem, which makes automatic water heaters and heating equipment, will continue to make Wheeling's Whitaker range boiler line and other items at its Chicago and Sparrows Point, Md., plants. To avoid delays in shipments Wheeling will continue operations and manufacture certain sizes and specifications for a short time.

Wheeling continued to make range boilers and tanks at Portsmouth since the sale of the plant to Portsmouth Steel Corp. in 1946. Detroit Steel Corp., which purchased the Portsmouth Steel plant (See STEEL Nov. 7, p. 83, Nov. 21, p. 56, Dec. 5, p. 64), contemplates extensive improvements there and will probably use the space being occupied for the range and tank operations.

Rheem has eight plants scattered over the U.S.; three plants are in California. The company has subsidiaries in Canada, Brazil, Peru, Argentina, Australia, Singapore and the Netherlands.

K. P. Fuhrmann and other key personnel of Wheeling's range, boiler and tank division will be associated with the Rheem organization.

Shippers' Merges Subsidiaries

KANSAS CITY CAR Co. and Acme Tank Car Corp., subsidiaries of Shippers' Car Line Corp., have been merged with the latter concern. Shippers' is owned by American Car & Foundry Co.

Robert Rogers, president of Shippers', says the smaller companies were absorbed to simplify overall corporate structure. Acme is in East St. Louis, Ill; Kansas City Car is at North Kansas City, Mo.

Taylor Forms Canadian Company

TAYLOR FORGE & PIPE Works, Chicago, formed Taylor Forge & Pipe Works of Canada Ltd.

The new subsidiary will be located at Hamilton, Ont. It will increase the productive capacity of the company which now has plants in Chicago, Carnegie, Pa., and Fontana, Calif.

The parent company was organized in 1900 by J. Hall Taylor, now board chairman of the company. It has pioneered in manufacture of various engineering products, notably wrought steel fittings for pipe welding, spiral welded pipe and a wide range of heavy forgings for boilers and pressure vessels. Operations at Hamilton will start in a new building now being designed.

J & L STEEL: Steel pipe from Jones & Laughlin Steel Corp. is a vital part of the $22 million Ravenswood Houses project in Long Island City, N. Y. Nearly 38 miles of the pipe are being used in the steam heating system for 31 six-story apartment buildings. Pipe sections are threaded and cut to length at a central pipe shop on the construction site

Allied Research Buys Hoffman

TO INCREASE its line of metal finishing chemicals Allied Research Products Inc., Baltimore, bought R. A. Hoffman Chemical Co., Cleveland.

H. C. Irvin, president of Allied, says R. A. Hoffman, formerly owner of the Hoffman company, will join Allied to be in charge of the development of new types of organic finishes.

Allied will retain Mr. Hoffman's former research laboratory in Cleveland as a branch of its Baltimore research division. Activities will be transferred to Baltimore when new laboratories are completed at the Allied plant (See STEEL Jan. 9. p. 35).

Benkart To Move To Coraopolis

BENKART STEEL & SUPPLY Co. moved into its new and larger quarters in Coraopolis, Pa., on Feb. 1.

The company has been in Pittsburgh for the last six years. It furnishes its customers with new and used industrial equipment: Overhead electric cranes, large storage tanks, materials handling equipment, etc.

Harris Doubles Capacity

SUBSTANTIAL increases in production capacity and manufacturing efficiency of Harris Products Co. are expected through the company's expansion program says Charles H. Bitzer, president. The program was developed since acquisition of Harris last May by Cleveland Graphite Bronze Co., Cleveland.

Harris' Cleveland operations were transferred early last month from its Cowan Rd. plant to larger quarters in a building owned by Cleveland Graphite. The new layout will double present capacity for producing Silentbloc, Torflex bushings and Harris shackles used by the automotive industry.

Truscon Expands in Alabama

TRUSCON Steel Co., a Republic Steel Corp. subsidiary, will begin production in May of steel bar joists at its Gadsden, Ala., plant. That facility is being nearly doubled in size. Now Truscon makes wire road mesh and fabricates concrete reinforcing bars at Gadsden.

Nevada Sells Parts of Plant

STATE of Nevada has sold three sections of the war-built magnesium plant in southern Nevada which it purchased from the federal government.

Combined Metals Reduction Co., Salt Lake City, will install an electrolytic palnt for refining ores mined in eastern Nevada.

Harvey Machine Co., Torrance, Calif., purchased a part of the plant for facilities to produce aluminum products.

National Lead Co., New York, bought two units in which it will produce titanium.

AC Gains Ground

DIRECT current, once the accepted power for overhead cranes, is losing ground to AC. During 1949 AC-controlled cranes captured 60 per cent of the industry's production.

One important factor in the switch was development by Harnischfeger Corp., Milwaukee, of the Magnetorque control or Eddy current preloaded controllable speed motor, more than 300 installations of which have been made since its introduction (STEEL, Feb. 9, 1948, p. 94).

U. S. Patent Office has granted Harnischfeger patent number 2493607 on the device. Applications for foreign patents have been made.

Briefs . . . .

American Car & Foundry Co., New York, received an order from the Lackawanna Railroad for 300 covered hopper cars. They will be 70-ton capacity cars, identical with 100 units completed for Lackawanna in October, 1949. The cars will be built by ACF's Berwick, Pa., plant.

Lock-Joint Pipe Co., East Orange, N. J., under contract to supply Chester Water Authority with cement pipe to carry water from the Octario creek to Chester, Pa., leased a 19-acre plot in Kennett Square, Pa., from J. B. Swayne. The company plans to erect a plant for production of pipe starting in April.

Aurora Metal Co., Aurora, Ill.—Auromet die castings—named Mayer & Roth, Cincinnati, sales representative for aluminum bronze and silicon bronze vacuum die castings in southern Ohio and southeastern Indiana.

Kelvinator of Canada Ltd., London, Ont., will spend $2 million in expansion of its plant this year. The program will almost double present floor space and is scheduled for completion in 1951.

Princeton Paint Laboratories, Princeton, N. J., developer of Aviation Primer No. 10, licensed United Chromium Inc., New York, to manufacture and distribute the organic coating that eliminates etching such hard-to-coat metals as aluminum, magnesium, zinc and stainless steel. The product will now be marketed under the trade name Unichrome Primer A.P. No. 10.

A five-week program on "Metals Used by the Jewelry Industry" will be conducted by the Rhode Island chapter of the **American Society for Metals** and the **New England Manufacturing Jewelers' & Silversmiths' Association** at Brown University, Providence.

Wales-Strippit Corp., North Tonawanda, N. Y., appointed **E. W. Bliss Co.** exclusive foreign agent for the Wales Sheet Metal Fabricator. The Wales machine notches and nibbles angles, channels and sheets up to ¼ inch thick at the rate of 165 strokes per minute.

Walker Mfg. Co., Racine, Wis., announced intention of buying the forgings division of Harvey Mfg. Co. Walker manufactures hoists, jacks and motor silencers.

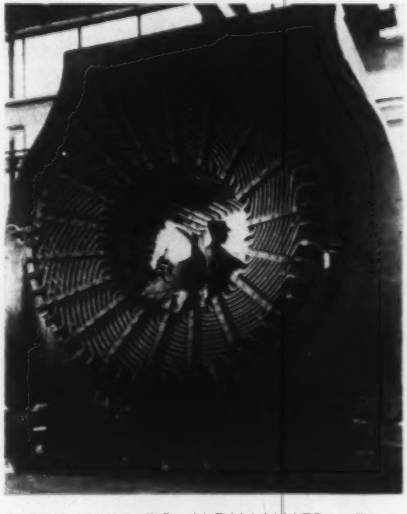
George K. Garrett Co. started a new expansion program to enlarge production facilities. First step is a new plant in Elwood City, Pa., which will cover more than 50,000 sq ft of manufacturing space. Garrett makes stampings and will do its own plating work.

National Rolled Thread Die Co., Cleveland, named L. C. Bigelow & Co. Inc., New York, to represent it exclusively in the sale of National Super Thread Rolling Dies for metropolitan New York and the western half of Connecticut.

Kaiser Steel Corp. announces the moving of the Southern District Sales to new and larger quarters at 612 S. Flower St., Los Angeles.

Standard Transformer Co., Warren, O., appointed A. J. Elggren & Sons Co., Salt Lake City, Utah, exclusive agent covering Utah, Wyoming, Idaho and western Wyoming. A complete line of transformers for distribution, power, metering, testing and street lighting is offered.

Riverside Metal Co., Riverside, N. J., added two new district sales offices and tieups with Edgecomb Steel Corp., J. M. Tull Metal & Supply Co., Alaskan Copper & Brass Co. and Metal Goods Corp. Riverside, a producer of nickel silvers, phosphor-bronze and beryllium-copper, added 24 new centers of service throughout the U. S. by its tieups with the other metal companies.



MOUNTAIN TO MOHAMMED: Time was when a piece of electrical apparatus weighing 70 tons would be put into place to stay there permanently. Not so today. When a giant stator, used at Inland Steel Co. for 26 years, needed rewinding for higher voltage, it was moved to the Westinghouse Mfg. & Repair plant in Chicago. By bringing the job to the fully-equipped shop, time required for rewinding is reduced considerably

A. B. Dick Co., Chicago, manufacturer of mimeograph products, named H. C. Anderson Mimeograph Corp., New York, authorized distributor for the New York area. The new corporation acquired assets, facilities, sales, services and offices of Adkar Mimeograph Corp.

Erico Products Inc., Cleveland, is the new name of Electric Railway Improvement Co. The move was made to more broadly define the company's application of its bonding and welding processes. The company is especially developing the use of the Caldwell process for welding copper to steel or copper in which no outside heat is required.

Chain Belt Co., Milwaukee, appointed: Arkansas Bearing Co., Little Rock, Ark.; Pacific Hardware & Steel Co. Inc., San Jose, Calif.; Polson Implement Co., Seattle; and Winn Supply Co., San Diego, Calif., as distributors for the products of the Chain & Transmission, Baldwin-Duckworth and Conveyor & Process Equipment divisions of the company.

Hickory Springs Mfg. Co. Inc., Hickory, N. C., which completed its 1949 remodeling and expansion program, now has over 46,000 sq ft of floor space in a modern three-story building. The company increased production capacity of its springs for the bedding industry by 75 per cent.

Laclede-Christy Co., St. Louis, announces it can now supply refractory users in Oregon, Washington, Idaho, Alaska and certain export territories various qualities of fireclay brick, special hand-molded shapes and arch wall tile from Abbotsford, British Columbia.

Link-Belt Co., Chicago, opened a factory branch store and warehouse in Kansas City, Mo. It carries ample stocks of conveying and power transmission machinery parts, chains, sprockets, bearings, speed reducers, elevator buckets, etc.

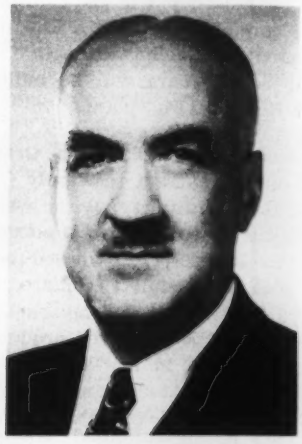
Production is underway on a documentary film for the **International Acetylene Association:** A two-reel color motion picture to be produced by Trans-Film Inc., New York. To be completed and ready in April, the film will review the origin of oxygen and acetylene and their combination to produce the terrifically hot flame.

M. O. Satin Co. was formed in Philadelphia to sell steel and steel products.

Men of Industry

JAMES H. BINGER

GEORGE H. HODAPP



ALEXANDER CROMWELL

James H. Binger has been elected vice president and general manager of the Belfield Valve Division, Philadelphia, of **Minneapolis - Honeywell Regulator Co.** He will be in charge of manufacturing and engineering in the valve division, as well as co-ordination of the sale of valves through the Brown Instruments and other divisions of the company. He has been with Honeywell since 1943, and was promoted from assistant vice president to his new office.

—o—

Harnischfeger Corp., Milwaukee, announces appointment of **Melvin O. Monsler** as sales manager of the P&H welding division, with which he has been associated for 12 years.

—o—

Hugh C. Land, assistant to the production manager of **Pennsylvania Salt Mfg. Co.,** Philadelphia, has been appointed production manager.

—o—

David K. Stuart has been appointed manager of the Pittsburgh branch of **Crucible Steel Co. of America,** Pittsburgh, and **Richard J. Rand** as assistant branch manager. Mr. Stuart fills the position left open by promotion of **John S. Billingsley** to central sales manager last August. **Joseph Schrader,** formerly with the metallurgical department of the Halcomb Works, has been appointed assistant superintendent of the electric furnace department at the company's Midland Works.

—o—

Fred W. Sexauer has been named manager of tube sales for **Brainard Steel Co.,** Warren, O., subsidiary of Sharon Steel Corp. Mr. Sexauer formerly was with Michigan Tube Products Co., Detroit.

George H. Hodapp has been elected president of **Heller Bros. Co.,** Newark, N. J. **James G. Henry Jr.** was elected vice president and secretary, **Anna W. Ibach,** treasurer, and **Eugene M. Steenburgh,** assistant secretary. Mr. Hodapp for several years was vice president of the Huntington, W. Va., division of Adel Precision Products Corp.

—o—

United Engineering & Foundry Co., Pittsburgh, announces election of **F. F. Brooks Jr.** to the position of vice president and general manager of its subsidiary, **Lobdell United Co.,** Wilmington, Del. He also was made a director of Lobdell United.

—o—

American Iron & Steel Institute, New York, has elected two new directors to fill existing vacancies. **John N. Marshall,** chairman, Granite City Steel Co., Granite City, Ill., succeeds the late **Hayward Niedringhaus,** chairman of Granite City Steel Co.; and **E. L. Clair,** president, Interlake Iron Corp., Cleveland, succeeds **Leigh Willard,** retired chairman of Interlake.

—o—

National Lead Co. announces appointment of **Erik Anker** as managing director of Titan Co. A/S, Fredrikstad, Norway. He succeeds **Dr. Gustav Jebson,** retired. Mr. Anker was export manager of Norwegian Aluminum Co. until 1937 when he became sales manager of Titan Co. A/S. National Lead also announces that all activities of its titanium division will be directed by **Joseph H. Reid,** who succeeds **D. W. Robertson,** former general manager. Mr. Reid is manager of the division and Mr. Robertson will continue in a consulting capacity.

Alexander Cromwell has been appointed vice president of **Soule Steel Co.,** San Francisco. He has been vice president of Johns - Manville Corp. since 1937, and in charge of all that company's factories since 1945. He will also be a member of the Soule board of directors, and will directly manage the company's coast-wide steel building products business.

—o—

William J. Powers, since 1949 acting manager, clad and conversion sales department, **Lukens Steel Co.,** Coatesville, Pa., has been appointed manager of the department.

—o—

Joseph W. Powell Jr., vice president, American Research & Development Corp., Boston, has been elected president of **Circo Products Co.,** and **Fenton M. Davison,** vice president, has been placed in charge of all operations of the company. Mr. Powell succeeds **John F. Black,** who has resigned as president and director of the company. New general offices of Circo Products Co. have been opened at 6531 Euclid Ave., Cleveland.

—o—

C. W. Hockman has been appointed superintendent in charge of foundry operations for **Cadillac Motor Car Division,** General Motors Corp., Detroit. He succeeds **J. E. Bunch** who has been transferred to special assignments in the manufacturing division.

—o—

John C. Ewer, abrasive engineer in the Boston district for Norton Co., has been appointed assistant general manager of **Norton Grinding Wheel Co. Ltd.,** which is Norton's branch plant in Welwyn Garden City, Herts.

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Ohio MAGNETS

A-192-

England. He will leave for England to take over his new responsibilities about May 1. **Raymond J. Forkey,** abrasive engineer in Rochester, N. Y., will take over the district vacated by Mr. Ewer.

—o—

Peabody Engineering Corp., New York, announces appointment of **Stephen A. Sloan** as manager of research and development.

—o—

Chemical plants division of **Blaw-Knox Co.,** Pittsburgh, announces appointment of **L. W. Alberts** as manager of its recently organized synthetic fuels and chemicals department.

—o—

J. Geoffrey Notman has been appointed executive vice president of **Canadair Ltd.,** Montreal, Canada. He is a former vice president of manufacturing with Dominion Engineering Works Ltd.

—o—

C. J. Marlett, representative in the Chicago district for **Kennametal Inc.,** has been transferred to the company's engineering department at Latrobe, Pa., as project engineer to engage in research and development on new applications of Kennametal.

—o—

Donald L. Clark, Lockport, N. Y., has been appointed to fill the unfinished term of vice president of the **Electric Metal Makers Guild Inc.,** made vacant by the resignation of **E. J. Chelius.**

—o—

Three new directors of **Atlantic Steel Co.,** Atlanta, are: **C. B. McManus,** president of Georgia Power Co., and two Atlantic Steel vice presidents, **Joseph H. Girdler** and **Howard B. Johnson.**

—o—

C. B. Neal has been elected president of **Outboard, Marine & Mfg. Co. of Canada Ltd.,** Peterboro, Ont., Canada. He has been vice president and general manager since 1948.

—o—

Erb Gurney has been appointed manager of sales for forgings, castings, and ordnance by **Bethlehem Steel Co.,** Bethlehem, Pa.

—o—

Victor G. Raviolo has been appointed engine engineering assistant to **Earle S. MacPherson,** chief engineer of **Ford Motor Co.,** Dearborn, Mich. He has been head of the engine section of the engineering research department.

—o—

Charles B. Belknap of Owens-Illinois Glass Co. has been elected to the board of directors of **Arthur D. Little Inc.,** Cambridge, Mass. **Howard J. Billings** was elected treasurer to succeed **Henry G. Powning,** and will also be in charge of the company's non-technical internal operations, formerly the responsibility of **T. L. Wheeler.**

—o—

Frederick Ayer, New York, and **H. A. Berg** and **Oscar Wells,** Birmingham, have resigned as directors of **Woodward Iron Co.,** Birmingham. **Charles F. DeBardeleben** and **Alfred Shook III** were elected to fill two of the vacancies, and the board has been reduced from ten to nine members.

—o—

L. R. Gustin has been appointed assistant superintendent of the Los Angeles bolt and nut plant of **Bethlehem Pacific Coast Steel Corp.** He previously served as general foreman of the bolt and nut department.

—o—

Elmer A. Lundberg, director of architectural design, **Pittsburgh Plate Glass Co.,** Pittsburgh, has been appointed director of architectural development and design. His new position results from a consolidation of his former department and department of architectural relations.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, announces appointment of **George S. Ashmun** to the position of general superintendent of its Otis Works, Cleveland, and that **John M. McColloch,** formerly superintendent of the finishing divisions at Otis Works, will succeed Mr. Ashmun as assistant general superintendent. Also announced are changes in assignments of the executive staff of the president: **V. H. Lawrence,** vice president of plant development and employee and public relations, was transferred to the newly created position of vice president-planning and control; **W. R. Elliot,** formerly general superintendent of the Otis Works, has been elected vice president-employee and public relations.

—o—

David G. Rae has been promoted from assistant general manager to general manager of **Lightning Fastener Co. Ltd.,** St. Catharines, Ont., succeeding **Dr. Harold G. Fox.**

—o—

R. G. Fredette, formerly with Raytheon Mfg. Corp., has been named production manager for **Hunt-Spiller Mfg. Corp.,** Boston.

—o—

T. W. Marx has joined Republic Rubber Division, **Lee Rubber & Tire Corp.,** as sales representative in the Pacific Northwest.

—o—

Solar Steel Corp., Cleveland, announces that **Ernest S. Thompson** and **Linton S. Steepe** will be sales representatives for its Hanover Division in the respective areas of New Haven, Conn., and Webster, N. Y.

—o—

Titus G. LeClair, assistant chief electrical engineer, Commonwealth Edison Co., Chicago, was nominated to succeed James F. Fairman of New York as president of the **American Institute of Electrical Engineers.**

—o—

Richard W. Claypoole has been appointed assistant manager of sales, railroad materials and commercial forgings division of **Carnegie-Illinois Steel Corp.,** subsidiary of U. S. Steel Corp., Pittsburgh.

—o—

American Society of Body Engineers Inc., Detroit, has elected the following officers for the ensuing year: President, **Lynn A. Fill,** chief engineer, Motor Products Corp.; vice president, **Charles L. Waterhouse,** manager of styling, Ford Motor Co.; secretary, **James L. Berridge,** design engineer.

GEORGE S. ASHMUN

V. H. LAWRENCE

W. R. ELLIOT

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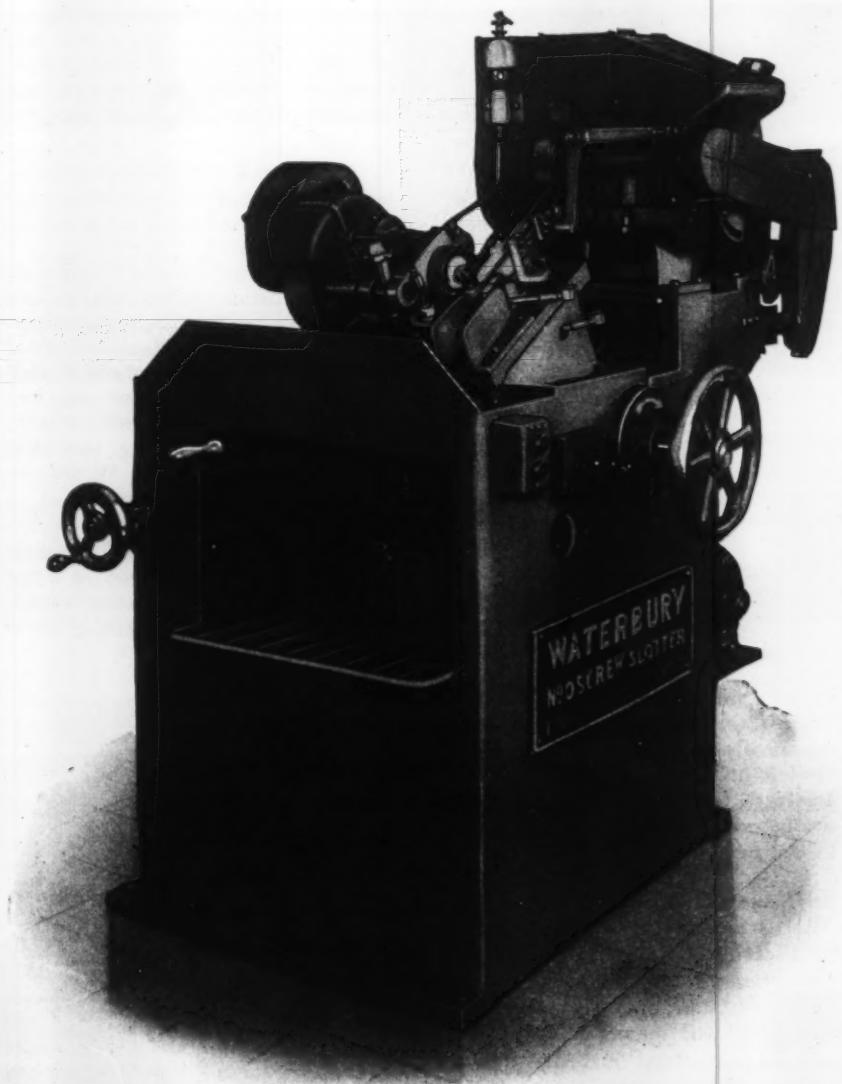
WATERBURY Screw Slotters



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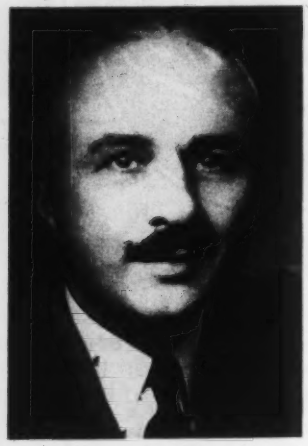
Waterbury, Connecticut, U. S. A.

SALES OFFICES CHICAGO CLEVELAND NEWARK, N. J.

Woodall Industries; and treasurer, **Edward L. Pangborn,** design engineer, Chrysler Corp.

—o—

Elmer C. Schacht has been elected president of **Behr-Manning Corp.,** division of Norton Co., Troy, N. Y. He succeeds **Francis E. Gallagher,**



ELMER C. SCHACHT

who is chairman of the board of directors. Other officers elected include: **Henry M. Elliot,** first vice president; **John O. Amstuz,** vice president; **Harold S. Turner,** controller and assistant treasurer; **Terence A. Cordner,** assistant controller; **William I. Clark Jr.,** secretary; and **Miss H. Vermaidel Teeling,** assistant secretary.

—o—

Donald S. Leonard has been appointed sales representative for **United States Graphite Co.,** Saginaw, Mich., and will make his headquarters in Pittsburgh.

—o—

Elliott V. Bell has been elected to the board of directors of **Revere Copper & Brass Inc.,** New York.

—o—

Robert C. Stockton has been appointed general traffic manager of **Stewart-Warner Corp.,** Chicago, succeeding the late **E. F. Stecher.**

—o—

Dr. F. D. Richardson has relinquished his position as head of the chemistry department of the **British Iron & Steel Research Association,** London, England, and has been appointed Nuffield research fellow in extraction metallurgy at the Royal School of Mines, London.

—o—

John H. Baninger, assistant chief engineer, **New Departure Division,** General Motors Corp., Bristol, Conn., has retired. He joined the division in 1926.

—o—

John S. Thompson and **Robert H. Maddan Jr.** have been named assistant managers of sales, central sales division, Columbia Steel Co., a **U. S. Steel Corp.** subsidiary, San Francisco. **Phelps Adams,** chief of the Washington bureau of the former *New York Sun,* will become on Feb. 20 a special assistant on the public relations staff of **J. Carlisle MacDonald,** assistant to the chairman of the board of United States Steel Corp.

—o—

Roy B. Jeffery has been named general manager, **Fort Schuyler Products Co.,** Utica, N. Y. He formerly was associated with Revere Copper & Brass Inc.

—o—

Vanadium-Alloys Steel Co., Latrobe, Pa., announces election of **Harry M. Reed** as a director, replacing the late **Alexander Nimick Sr.** Mr. Reed is secretary of the company.

—o—

E. C. Hughes, vice president of Bay State Abrasive Products Co., has been

E. C. HUGHES

elected president of **Grinding Wheel Institute,** comprised of 28 of the leading grinding wheel manufacturers in United States and Canada.

—o—

Raymond F. Gomber has been appointed assistant manager of industrial products advertising and sales promotion for **Westinghouse Electric Corp.,** Pittsburgh. **S. F. Davies Jr.** was appointed manager of the commercial, industrial and floodlighting section, lighting division; **A. George Rogers** was appointed assistant manager, home radio division; and **C. Swan Weber** was appointed manager, eastern district of the corporation, with headquarters in New York, succeeding to the position formerly held by **H. H. Rogge,** vice president.

—o—

General Steel Castings Corp., Granite City, Ill., announces election to the board of directors of **William S. Morris,** vice president, American Locomotive Co., and **James Macdonald,** vice president of General Steel Castings Corp.

—o—

D. L. Getz, chief engineer, Steel Products Engineering Co., Springfield, O., has been named chairman of the engineering and research committee of the **Stoker Manufacturers Association,** Chicago. He succeeds **Joseph G. Beard,** recently resigned.

—o—

Thomas Handley has been appointed sales manager for **Vic Pastushin Industries Inc.,** Los Angeles, manufacturer of aircraft components.

—o—

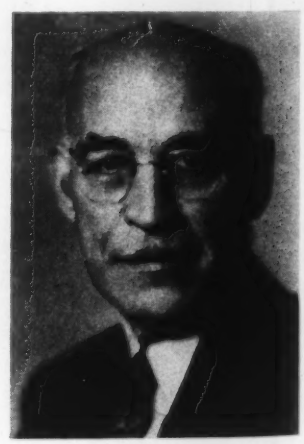
Arthur Schwarz has been elected vice president in charge of sales, **Nooter Corp.,** St. Louis. He has been connected with the firm since 1935.

—o—

B. F. Goodrich Chemical Co., Cleveland, announces the following appointments in the sales organization: **George B. Koch,** advertising and sales promotion manager, has been appointed staff representative for chemical sales to direct the promotion of agricultural chemicals; **F. L. McNabb** has been appointed staff representative for Hycar and rubber chemicals; named successor to Mr. Koch as advertising and sales promotion manager is **M. W. Osborne Jr.**

—o—

William R. H. Eby has been appointed to the newly created post of industrial sales manager, Pacific district, for York Corp., with headquarters in Los Angeles.



GEORGE H. BRODIE

George H. Brodie has been appointed vice president in charge of co-ordinating operations for **Packard Motor Car Co.,** Detroit. He has held the title of assistant to the president since 1945. During the four previous years he was manager of Packard's marine engine division.

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ALFRED O. WEILAND

AVERY C. ADAMS

JOSEPH H. CARTER

Alfred O. Weiland has been named general manager of the Lima Works, **Lima-Hamilton Corp.**, Lima, O. He was vice president and general manager of General Machinery Ordnance Corp., Charleston, W. Va., during World War II, and he previously was a partner in George A. Houston Co., consulting engineer, New York.

—o—

George Romney, assistant to the president, has been elected a vice president of **Nash-Kelvinator Corp.,** Detroit.

—o—

A. E. Thompson, production manager, **Midland Co.,** South Milwaukee, Wis., has been appointed purchasing agent.

—o—

Leroy A. Hillman and **Harold G. Wilson, New Departure Division,** General Motors Corp. sales staff, Bristol, Conn., have retired. Both men were affiliated with the division's Chicago office.

Avery C. Adams has been elected president of **Pittsburgh Steel Co.,** Pittsburgh, to succeed **Joseph H. Carter,** who has held that office since 1942 and who has been made board chairman and chief executive officer. The changes are effective Mar. 1. Mr. Adams, since Jan. 1, 1950, has been executive vice president, Detroit Steel Corp., and previously was vice president and a director of Portsmouth Steel Co. He was formerly vice president in charge of sales and a director of United States Steel Corp. of Delaware.

—o—

Calbert L. Dings has been named a sales representative in the Charlotte, N. C., district office of **Allis-Chalmers Mfg. Co.**

—o—

Kaiser Aluminum & Chemical Corp. has appointed **Fred J. Drewes** foil division manager of the company in charge of production and sales, with headquarters at the Permanente plant, Oakland, Calif. He formerly was works manager of the Permanente foil plant. **R. D. Harris,** plant engineer, was named plant superintendent.

—o—

William H. Lehmberg has been elected vice president of **American Felt Co.,** New York. He is chief engineer, and also general manager of the Glenville, Conn., plant.

—o—

Paul V. Clarke has been appointed sales representative in western Pennsylvania for **Star Tubular Products Co.,** Chicago.

—o—

W. M. Bertolet has been appointed testing equipment sales engineer for **Baldwin Locomotive Works,** Philadelphia, succeeding W. P. Smith in the Cleveland territory.

—o—

C. H. Beck, vice president, **Westinghouse Air Brake Co.,** Wilmerding, Pa., has retired.

OBITUARIES...

Charles E. Colegrove, 75, chief engineer for **White Sewing Machine Corp.,** Cleveland, for 25 years, and associated with the company 50 years, died Jan. 28. He had been inactive for the last three years, when he went on an indefinite leave of absence due to failing health.

—o—

Anton Campula, 53, founder and president, **Slagor Machine & Tool Co.,** Cleveland, died Feb. 2.

—o—

Joseph P. Arthur, 74, retired president and general manager, **Cyclone Fence Co.,** Arcadia, Los Angeles, died Feb. 2.

—o—

George W. Camp, 76, associated with **Ward Leonard Electric Co.** for 57 years, died Jan. 23 at his home in Mount Vernon, N. Y. He joined the company in 1892 and held many executive positions including general supervisor, purchasing agent and factory manager.

—o—

Robert Klotz, 68, retired eastern Pennsylvania manager for **Hercules Powder Co.,** Wilmington, Del., died Jan. 30 in Philadelphia. He retired in 1948 after 44 years' service with the company.

—o—

Oscar Onsrud, 81, chairman, **Onsrud Machine Works Inc.,** Chicago, died Jan. 28. He retired as president of the company in 1942.

—o—

William E. Daley, 52, assistant plant engineer, Edge Moor, Del., plant, **E. I. du Pont de Nemours & Co. Inc.,** died Jan. 1.

—o—

Charles Rieder Jr., 71, former district manager, **American Bridge Co.,** Philadelphia, died recently. He had retired six years ago and had been affiliated with the organization for 51 years.

—o—

William R. Angell, 72, retired Detroit and Muskegon, Mich., industrialist and former president of **Continental Motors Corp.,** died Jan. 25 in Detroit, from injuries suffered when struck by a city transit bus.

—o—

Maj. Albert B. Cudebec, 72, vice president of **Hydropress Inc.,** New York, died of a heart attack Jan. 28.

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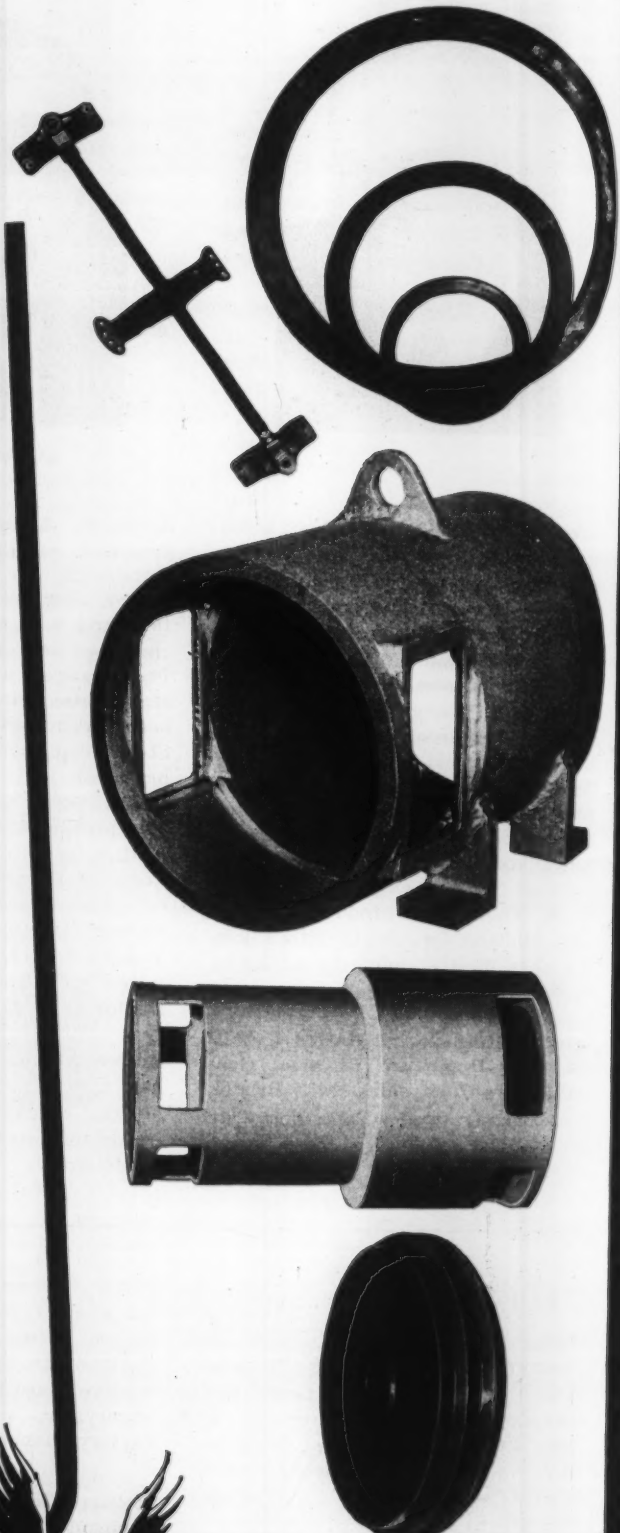

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110 DIETZ ROAD

Production AND Engineering
NEWS AT A GLANCE

LIGHT WEIGHT WITH "BROAD BACK"—One of the world's smaller railways is currently conducting an experiment that may lead to an important development in transportation circles. *Aluminum News,* published in Montreal, Canada, reports Canada's Roberval and Saguenay Railroad now has in service a box car with an all aluminum body—believed to be the lightest car of its size and type in existence. Its first operating load was a record-breaking 2243 bushels of grain weighing 134,000 pounds. Through use of 9600 pounds of aluminum sheet and extrusions, the car weighs only 34,000 pounds—some 6 tons less than the standard 46,500-pound North American car of less capacity.

NOISE PROBER—The power industry now has a new tool to help combat transformer noises, a thorny problem facing engineers and equipment designers. According to a report made before the American Institute of Electrical Engineers meeting in New York recently, a method referred to as "harmonic index" seems to be the most practical means of analyzing transformer construction and materials to overcome transformer audio noises. Factors listed as contributing to noise production were kind of steel used for the core, resonance of the transformer's mechanical structure, side frames and winding assembly. Sound absorbing enclosures currently available are costly, it was pointed out; therefore, either a quieter transformer must be developed or costly enclosures must be employed.

FAST ANSWERS—A rapid photometric method for determining chromium in 18-8 and similar steels is reported by Fisher Scientific Co., Pittsburgh. Method's speed is derived from the technique of simply dissolving the steel and measuring the absorption directly. Nickel, the only interfering element, need not be chemically isolated since judicial choice of a narrow band filter renders the interference negligible. With the method, Bureau of Standards steels were determined with a standard deviation of plus or minus 0.15 per cent. Optimum range extends from 7 to 25 per cent.

SIMPLIFIES METAL STUDIES—Simple, inexpensive method for mounting metallurgical specimens at temperatures only slightly above room temperature and without external application of heat is reported by National Bureau of Standards, Washington. Developed by Denton L. Smith, new procedure makes it possible to mount a wide variety of specimens for polishing and microscopic study without disturbing the crystal structure. It may be carried out in 15 to 30 minutes, depending on room temperature and without use of any special equipment other than an inexpensive mold and a clamp or vise. A material consisting of a polymer and monomer which, when mixed properly sets under pressure, plays an important part in the method.

ROUNDING BY ETCHING—Double - barreled results are derived from etching the metal cells incorporated in its electronic precipitator type air filters manufactured by American Air Filter Co., Louisville. The aluminum alloy plates used, which are 0.004-inch thick, are etched lightly to provide a capillary surface for retention of the special oil applied to the cells after cleaning. Same etching procedure also tends to round edges of the plates to promote efficient operation of the filter.

CUTS OPERATIONS—Deep drawing method soon to be used by Scaife Co., Oakmont, Pa., in forming half sections of propane gas tanks eliminates four to six operations in addition to washing, degreasing and annealing usually required between draws. It makes it possible to draw a 38½-inch blank of 0.105-inch steel into a tank half section 14¾-inches diameter and 24 inches deep in one simultaneous operation. Success of the process, capable of producing one section every 18 seconds, is largely due to special dies designed and produced by Schnell Tool & Die Corp., Salem, O. (p. 82)

"SPECIALS" PAY OFF — Special machinery is justified—if its use increases quality, decreases cost or reduces fatigue. Invariably two or more of these results are achieved, although prime objective may be cost reduction. But successful use of these semi and automatic production units is not contingent alone upon sound design and careful construction. Four factors must exist within the plant before there is any chance of these machines proving successful. They include optimistic management, cooperative supervision. (p. 84)

UNRESTRICTED BUSINESS—Manufacture of high alloy castings—castings containing 8 per cent or more of various alloying elements, chromium, nickel, manganese, copper, etc. —is relatively new in United States. These steels were first melted about 1926. Many practices were adopted since in making castings suitable for specific service requirements. Because the high alloy steel casting business is not restricted to any particular type of composition, alloys—with some modification—can be made to meet requirements for a host of applications. (p. 89)

BETTER WELDS—A new electric tube welding process developed in Cleveland not only provides better welds but makes it possible to join a greater variety of materials. The air-operated intermittent machine involved in the process employs surface contact electrodes to convey current across the seam cleft of the tube. Successful combination of mechanical and electrical devices produces a good tube weld with fine grain structure almost equal to the parent metal. (p. 99)

News Summary—p. 51 *Market Summary—p. 127*

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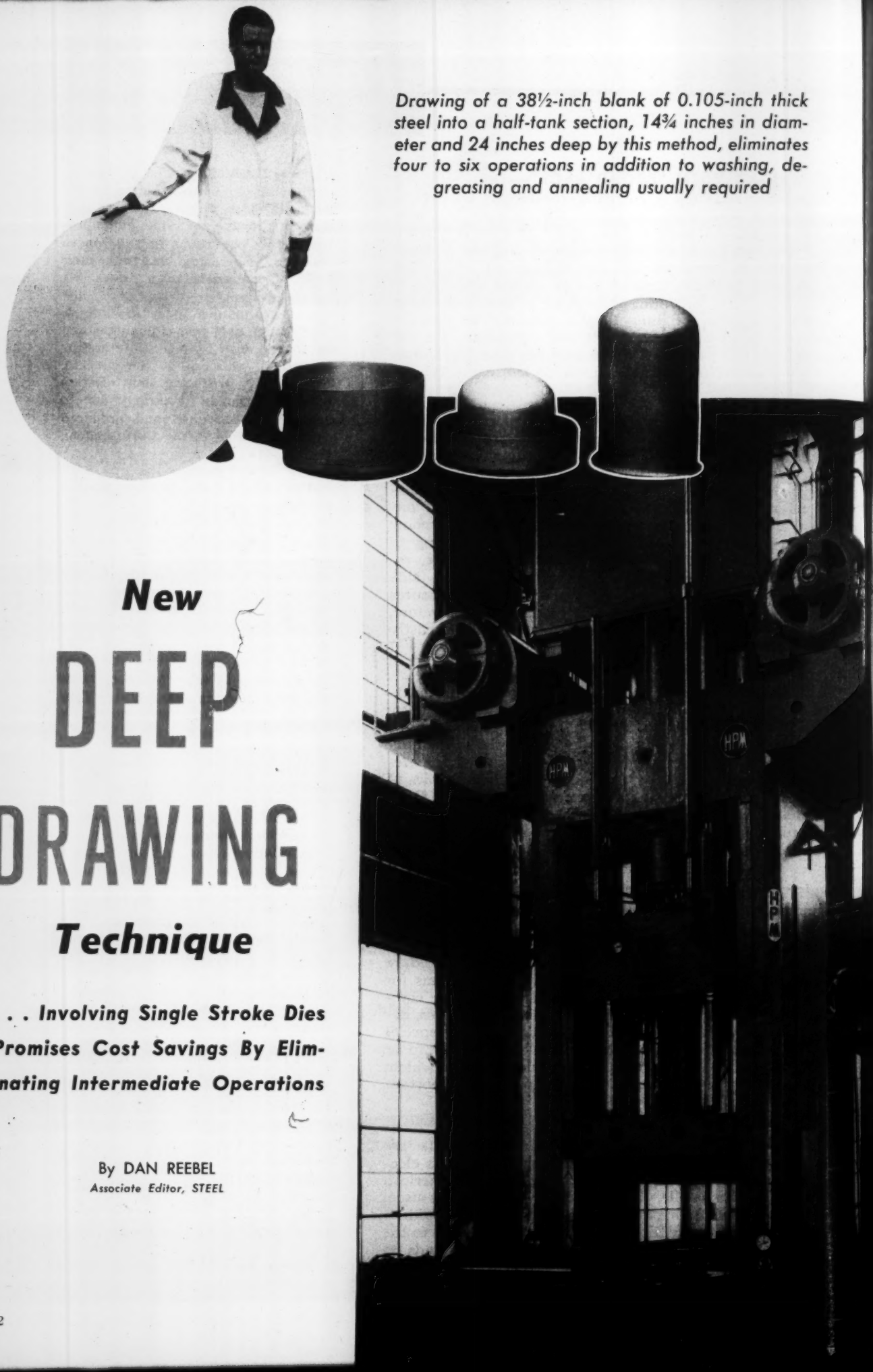


Drawing of a 38½-inch blank of 0.105-inch thick steel into a half-tank section, 14¾ inches in diameter and 24 inches deep by this method, eliminates four to six operations in addition to washing, degreasing and annealing usually required

New

DEEP DRAWING

Technique

. . . Involving Single Stroke Dies Promises Cost Savings By Eliminating Intermediate Operations

By DAN REEBEL
Associate Editor, STEEL

INGENIOUS deep drawing of propane gas tank half sections will soon be carried out at the Oakmont, Pa. plant of the Scaife Co. Success of the process is largely due to the dies which were both designed and produced by the Schnell Tool & Die Corp., Salem, O. Previously, such deep drawing required two or more successive operations with annealing and coating being performed between each draw; however, it is now possible for the operators to utilize a 38½-inch blank of 0.105-inch thick steel which is drawn in one simultaneous operation into a tank half section of 14¾ inches in diameter and 24 inches deep. Four to six operations have been saved in addition to washing, degreasing and annealing which are usually required between each draw. Patents are pending covering the principles involved in producing such a part on these dies by one stroke of a press.

The Schnell organization, during the designing of the dies, set up a small scale working model press to test the feasibility of such a single deep drawing operation. After the test had been pronounced successful, the company ran other types of steel and found that it worked equally well with analyses other than high-tensile steel. Material was tested from 1/32 to ⅛-inch in thickness and uniform deep-drawn tank half sections were produced in all cases.

This process can produce one section every 18 seconds if the press used for drawing is capable of handling the work. Engineers who designed the dies believe that the faster the draw, the better the finished product.

Fig. 1 (upper left)—Starting steel blank and various stages of the single deep draw including finished tank half section

Fig. 2 (left)—General view of 750-ton HPM hydraulic press showing auxiliary loading and unloading device. Die is seen installed in press

Fig. 3 (left, below)—View showing front of fixture gripping tank half and moving new blank to deposit on the die

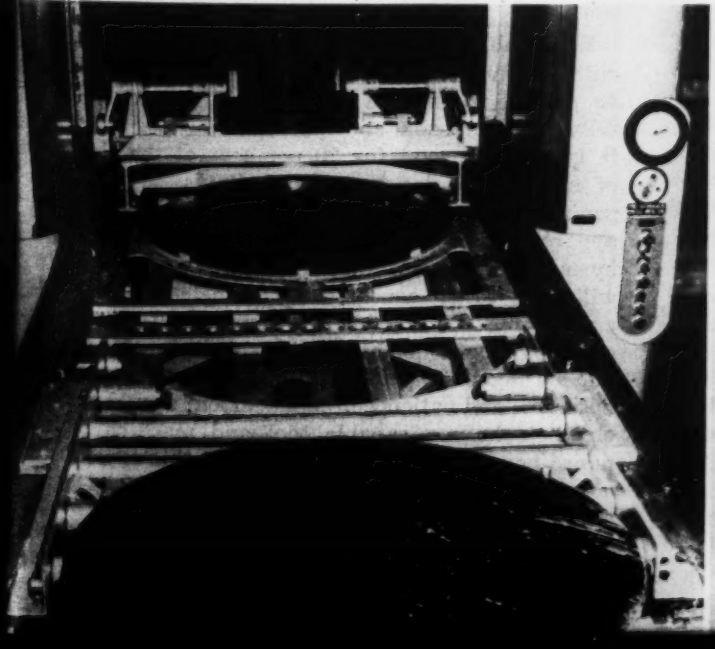
Fig. 4 (right, below)—Rear view of fixture showing tank half about to be dropped on removal conveyor

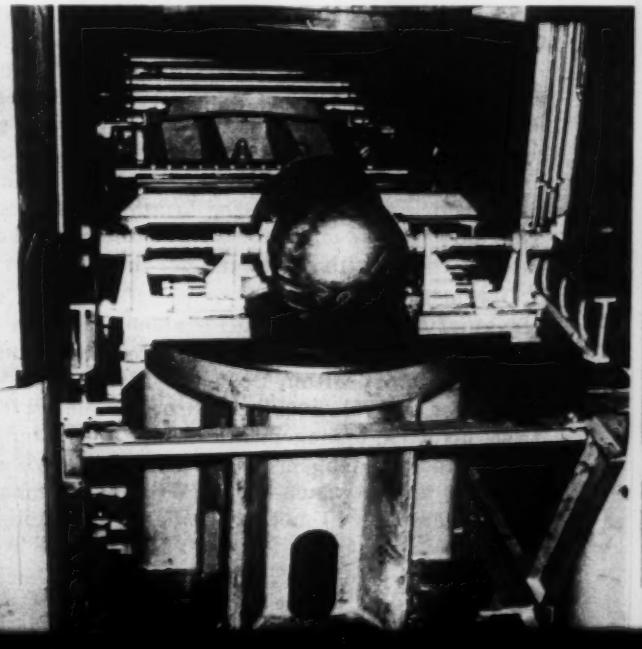
Possesses Improved Metallurgical Properties—This single deep drawing operation affords a substantial savings in required manpower and material, in addition to elimination of additional dies, furnaces, soaking pits and wash tanks required for the now unnecessary intermediate operations between draws. The finished half shell possesses better metallurgical properties in that there is less metal distortion and a pronounced absence of thinning which results in a more even wall thickness.

In the process, a blank is delivered to the loader conveyor, either from continuous cleaning and draw-coating equipment or placed on a conveyor manually from a shop truck or skid. Degreasing and Gilron dry draw coating are the only operations required prior to drawing. The stock preparation unit must be timed by means of variable speed drives to deliver blanks to the loader at intervals conforming to the desired press cycle. An operator starts the hydraulic systems on both the press and fixtures and presses a switch button which begins the automatic cycle of the press.

The press goes through one complete cycle of power stroke and return. As the main slide reaches a predetermined height on the return stroke, a limit switch is tripped, causing the loader to move forward with the first blank, which is delivered and located at the proper location of the die's draw plate. At the extreme end of its forward travel, another limit switch is contacted, which reverses the flow in the hydraulic cylinder, returning the loader slide to the open, or pickup station. On this return stroke, other electrical contacts are made—one to start the press on its draw cycle and another to release a blank to the loading hopper. All movement of the loading equipment is stopped at this point.

Redrawn Over Lower Punch—Drawing of the tank half shell now commences. The blank holder and main ram descend, the proper pressure is applied to the blank holder as the hollow punch makes contact with blank and the first draw is effected. As this punch descends, the drawn shell travels with it and is redrawn over a lower or internal punch, resulting in a finished shell (*Please turn to Page* 108)





By C. A. NICHOLS
Master Mechanic
Delco-Remy Division
General Motors Corp.
Anderson, Ind.

SPECIAL MACHINERY . . . . PAYS OFF

Well-designed and properly applied "custom" equipment can be an important means of increasing production and improving quality at reduced cost

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SPECIAL machinery is justified if its use increases quality, decreases cost or reduces fatigue. Almost invariably two or more of these results are achieved. Although the prime objective may be the reduction of cost it is usually found that the quality of the product is improved. This is especially true in the use of automatic machinery.

Successful operation of such equipment depends on the uniformity of the material or parts fed to the machine. It is often necessary to make an improvement in these parts or the material to achieve success with the special equipment. This does not always lead to increased cost, since a study of the variation in the material prior to the special tooling will frequently lead to possible improvement either at no cost or an additional saving. It is almost axiomatic that special equipment, usually of a semiautomatic nature, will improve quality because of its tendency to reproduce faithfully a cycle of operations and act as an inspection device.

Automatic inspection is frequently incorporated in a special machine. These devices may be used in such a manner that defective pieces may be ejected or the machine may be stopped. On more complicated equipment, signalling devices can be incorporated which will indicate the location of the trouble. This enables the operator to get the machine back into operation with minimum lost time.

Optimistic Management—Successful use of special machinery is not contingent alone upon its sound design and careful construction. Four important factors must exist within the plant before there is any chance of special machinery proving successful. The first involves management. Only under optimistic and patient management is it possible to acquire and use special machinery. Without optimism the initial gamble will not be made. Since the equipment is special it is not possible to see the identical machine in operation in some other plant.

A study of the initial design layouts can always lead to controversy as to the best basic plan and a pessimist can suggest sufficient possibilities of failure to kill the idea. An optimistic manager will be aware that any special machine will have more faults than a standard machine, since it is generally the first one of its kind. If he has confidence in his organization, he will know that any faults that develop will be rectified.

An optimistic manager will contribute greatly to the enthusiasm of those who are responsible for special machinery. His leadership can so inspire the group that extraordinary accomplishments are possible. He can fan the flame of creative effort or he can cast a chill that will deter the men from putting out that extra effort which is so necessary in this work.

Reasonable Patience—Optimism must be followed with reasonable patience. Any machine will work on paper. No special machine will operate successfully just as soon as final assembly is completed. It is not abnormal for 20 per cent of the final cost of a machine, designed and built by a capable organization, to be expended after the machine has apparently been completed. This must be recognized by management. If they are not aware of this they will jump to the conclusion that their machine builders are not too capable. A real test of a good machine builder is not his ability to stay out of trouble, but his ingenuity and speed of getting out of it. The optimism and patience of management should be based on their having capable tool and machine maintenance personnel available. Without this type of personnel no continued successful use of special equipment is possible.

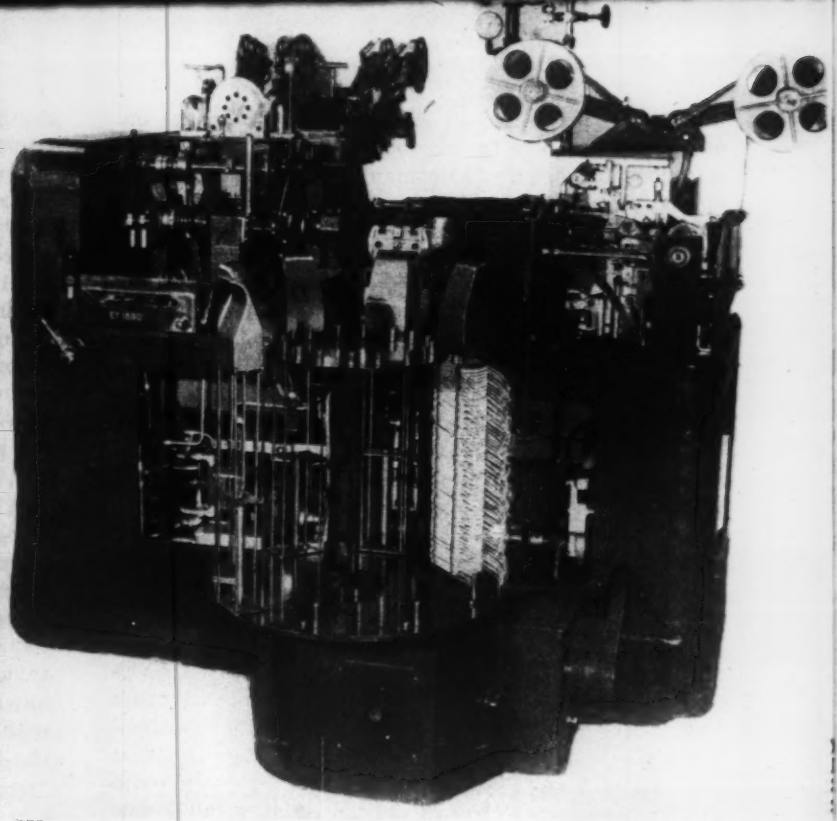

Fig. 1 (left)—Machine for automatically welding seam of frame for an automotive generator

Fig. 2 (right)—Machine for automatically winding generator armature coils

A properly built and processed machine with a trained operator will produce anywhere it happens to be located, for a while. The first time there is trouble and unskilled help attempts to rectify it, the machine will begin to be a source of trouble. A small plant, whose product was built around the use of three special machines, found itself unable to meet production schedules. When outside assistance was secured it was found that the machines were in deplorable shape, since the plant had never seen fit to employ a single mechanic, although the profit of the plant had been sufficient to afford one. It was necessary to rebuild the equipment completely to resume normal production. One good mechanic could have readily maintained the machine in good working condition and might even have improved their productivity.

Skilled help for maintenance is most important if hydraulic or electronic equipment is involved, although any machine will depreciate rapidly and fail to perform properly if normal repair, adjustments and lubrication are not faithfully carried out. Increased use of special machinery usually results in a percentage increase in the number of tool and maintenance men and, if much labor saving is made, an increase in the per cent of plant overhead. This must be evaluated from the standpoint of the total effect on cost.

Co-operative Supervision—Successful use of special equipment is influenced by the attitude of production supervisors. If their co-operation can be secured, the possibility of successful operation is vastly increased. This can be secured by making every effort to convince them from the start that their interests are being considered.

From data presented by the author before the annual meeting, American Society of Mechanical Engineers, New York, Nov. 27-Dec. 2, 1949.

The special machine group is a service organization for production departments and should operate with that fact in mind. They don't build machines to demonstrate their own cleverness, but to help production make a better and lower cost product. Equipment forced upon production won't work satisfactorily. Supervisors and foremen are brought into design meetings and their suggestions and opinions given careful consideration. If they realize that the machines are designed and built for them and that the success of the venture will reflect their supervision ability, the path to efficient operation will be much smoother.

Not all supervision welcomes the advent of special machinery into their departments, since it disturbs the established routine and perhaps requires a different type of thinking. A thorough selling job is required on the part of those responsible for the acquisition of new equipment and a progressive and open-minded supervisor is often the difference between success and unsatisfactory operation.

Operator Training—Along with co-operative supervision, operator training is essential. A plant having a good system can save many of the headaches that could occur when new equipment is being placed in operation. The first requirement is a training supervisor who has a production viewpoint rather than the machine builder's. Unfortunately, the man who has built a machine and who knows the most about it is often a very poor operator and instructor. He will hover over a new machine and adjust or alter it on the slightest pretext. He is the proverbial mother hen with her brood of chickens. He is not

necessarily interested in the same things as the operator. A man with a good production sense who is a good teacher and salesman is needed. He should not be a good mechanic, else he will tend to become an inventor.

If possible the machines should not be placed in the production department during operator training, but should be in a separate area devoted to such work. This prevents the operator from being exposed to outside influence and contributes to his sense of importance and lessens his nervousness when learning a new job. Suggestions as to location and ease of controls, location of raw and finished stock, containers, etc., should be solicited and given very careful consideration.

Properly treated as an important individual, the operator will often show as much pride in the finished machine as its designer and builder. If he can be made to feel that he has made important contributions to the success of the venture, he becomes a good salesman for that and other new jobs. Girls trained to operate one of a group of new machines have insisted that they be placed on the identical machine on which they were trained, showing that they have acquired a sense of pride and ownership in the machine. Visitors are frequent around new machines during the instruction period and a clever trainer will have the operator explain the machine to the visitor. He sells himself as he sells the machine.

Continued use of the operators initially trained to use the equipment may not be possible, but once the methods and production standards are set it is the duty of production supervision to see that they are continued. If the machines are properly serviced and other conditions do not change, the precedent once established is not difficult to maintain. Being assured that the type of organization is such that special machinery has a good opportunity for success, how is it determined—what jobs should be considered?

Job To Be Done—The machine may be for a newly designed product which has not been in production; it may be impossible to produce a part except through the use of a special machine or it may be required for reduced cost. The job may be an old one where study has shown that special machinery will improve the operation. The suggestions for a special machine may come from management, supervision, engineering, or through an operator suggestion plan. In high production plants, a large number of people doing an identical operation indicates the possible use of a special machine. Proper selection of projects to develop should be governed by the value of the result.

With a limited rate of expenditure permitted, projects should be chosen with care to be assured that the expenditure yields the best possible return. Most plants, even with moderate production have applications for special equipment. When spending money for such machines, the best choice is the job that requires the least investment, makes the greatest savings and can be completed the quickest. It is unwise to choose the first job that attracts attention, without a careful analysis of the plant to see where the best investment can be made.

Cost Estimate—It is important that a cost estimate be made even before proceeding with the design. In the first enthusiasm for a new idea many factors of a detrimental effect are apt to be ignored. A conference at this stage for the benefit of the cost estimator is helpful. This group includes representatives of production supervision, product engineering, plant layout, tool and machine building supervision, machine design and cost accounting. Factors to consider are as follows:

1. Present production schedule and possible schedule changes.

2. Actual present production rate. This figure might be assumed to be so apparent as to require no

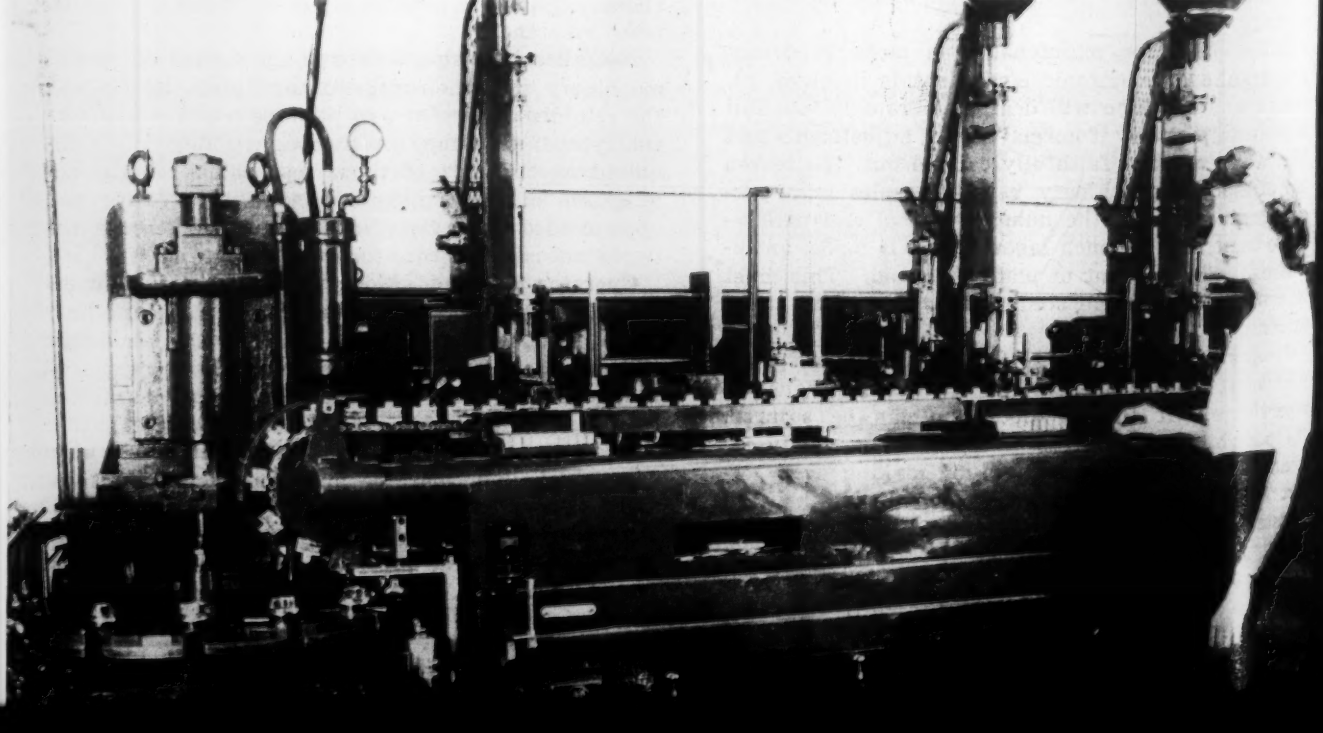

Fig. 3—A special automatic assembly machine for five different parts. After each part is fed into the assembly, automatic inspection devices check to assure that the part has been fed and properly located

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check. A careful study of the actual production possibility of the present method may show that the rate is or could be considerably different from what is generally recorded or accepted. The actual rate of production may be lower than it is thought to be, but other operations in the department may be better enough to show a good departmental efficiency, even though this one machine may be unable to produce at the rated standard.

On the other hand, the machine might be producing at a higher rate and aiding in carrying other inefficient equipment. Relatively inexpensive changes may make it possible to produce at a higher rate. The new equipment should be compared to the best possible performance of the present method.

3. How long will the model remain in production? Checks with sales and engineering departments will show whether there will be sufficient total production to be certain that the cost of the equipment will be amortized before it is obsoleted.

4. Changes in the model that might be made at the time of retooling. When considerable expenditure is being made for new equipment, it is wise for sales and engineering to study the model for desirable changes and improvements that might improve the quality of the product with possible additional savings. The proposal to change a method of manufacturing may stimulate the imagination of the product designer, causing him to think of possible changes which had not previously been under consideration. These may be of a vague nature and, through protracted indecision, delay the start of a desirable project. Often minor concessions by engineering will simplify the special machine.

5. Adaptability of the machine to future model changes. It may be possible to design the machine so that it does not too seriously restrict the possibility of producing similar pieces of different size or design. Whenever possible this should be given thorough study or minor product design changes might be impossible without obsoleting expensive production facilities. Where there is complete assurance that there will be no changes over a long period, the cost of the machine may be kept lower by not making it universal.

6. Required rate of the machine. This is dictated primarily by the number of pieces to be produced per day. It may be fixed by the production rate of a balanced line. There would be no value in producing more pieces than are fed to it by preceding machines or can be used by machines following it unless it is possible for an operator to operate some other machine as well. If the machine is not in a balanced lineup, the production rate may be determined by the cost of the equipment. Very expensive machines may be operated more hours per day to keep down the investment. If multiple machines are required it may be possible to operate more than one per operator and this might be profitable even though the productive rate per machine is lowered.

7. Skilled or general classification operators required. Type of operator required may determine the hourly rate to be paid. This is a factor in the potential saving of the machine.

8. Cost of the special machine. This should include the cost of designing, building and bugging. The most difficult part of the estimate is the latter. It may run from 10 per cent to 100 per cent over the cost of building the machine originally. A fair average figure for this would be approximately 20 per cent.

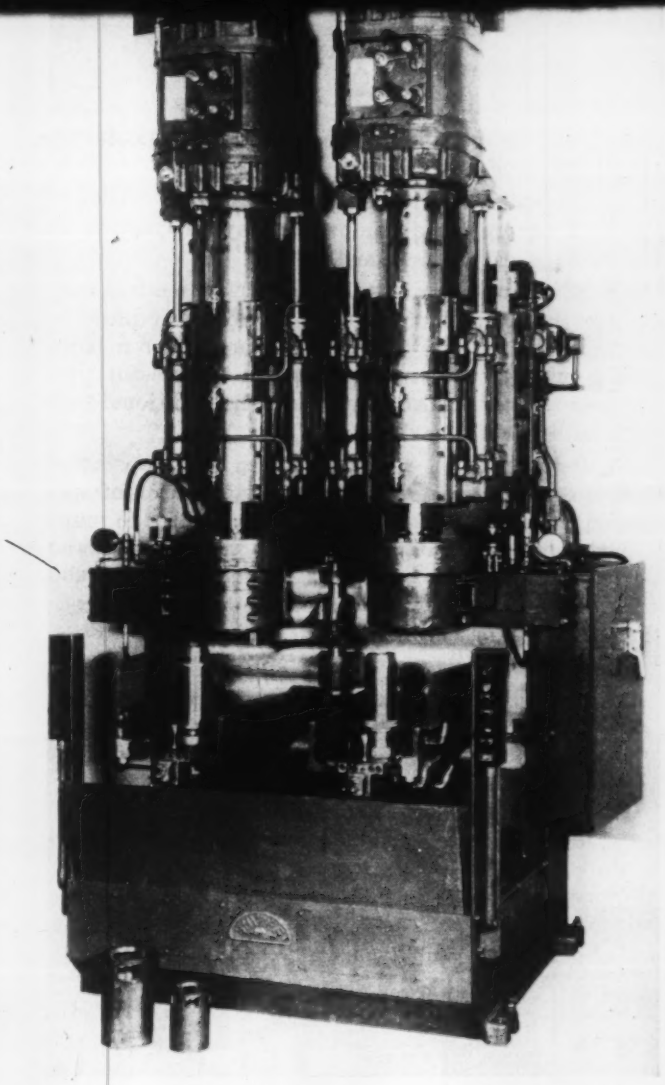

Fig. 4—Two-spindle semiautomatic special machine for boring generator frames shown in front of the machine bases. These are 4½ inches ID

9. Effect on preceding or subsequent operations. Very often the use of a special machine to perform an operation will be affected by the condition of the parts fed to it to such an extent that improvement or changes might be required in the preceding machines. This may affect the saving adversely or lead to further cost reduction. Generally, the necessary improvements in the parts to be processed in automatic machines would have been as desirable and profitable for hand operation. In the manufacture of automotive generators the use of automatic lead connecting machines forced an improvement in the commutator notching operation. Although this was not initially contemplated, the new machines for this purpose gave the required improvement and paid a good return on the investment.

10. Changes in plant layout, ventilation and utilities distribution. Cost of installation, conveyors, ventilation and improved facilities such as transformer capacity—power, air, gas and water lines—are costs that may be incurred in the use of special machinery

and should be included for the purpose of calculating return on investment.

11. Disposition of replaced equipment. Salvage value of the replaced equipment may be credited to the savings of the new method.

12. Effect on the material cost. New method may change the amount of material required per piece or may change its specification. If the use of a more costly material is required for the successful performance of automatic equipment, the additional cost may nullify other savings.

13. Percentage of rejects. Scrap or reoperation cost is often of importance in the justification of special equipment. A special machine was built to make a part purchased outside, but when the cost of scrap parts was charged against the savings, it was found that the special machine was not making the estimated return on the investment.

14. Effect on plant overhead.

A—Perishable tools and nonproductive materials. Often a part of the saving may be nullified by ignoring the cost of tools and nonproductive materials required by the new method.

B—Cost of utilities.
Power, steam, gas and air may be important factors in the cost of operation and should be checked when an estimate is being prepared. It may cost as much for an air blast to eject pieces as it does for labor to operate a machine.

C—Cost of machine and tool maintenance.
These items should be included in the cost. They may go either way, but on the average the machine maintenance cost will increase if the equipment has increased in complexity. It may temporarily decrease due to the relative age of the old and new machines, but the average over the life of the equipment should be considered.

D—Depreciation.
The changed capital investment will alter the annual charges for depreciation.

E—Effect of reduced labor cost.
If the machine was built on a labor saving basis, the plant burden will increase since all other costs are pro-rated against a lower labor cost. Management should be prepared for an increase in percentage overhead if extensive use of special machines for labor savings is followed.

These factors properly evaluated and tabulated will show whether the special machine is a worthwhile investment. This estimate should be periodically checked during the design phase to find out if further check materially alters the figures.

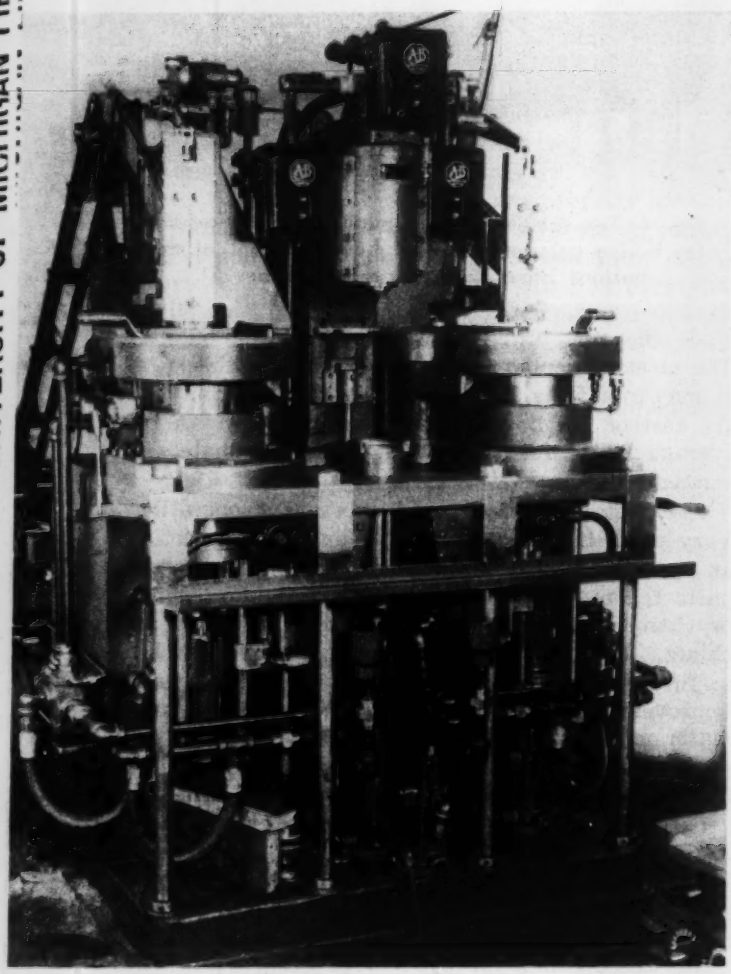

Fig. 5—Partial view of a special machine for assembling the U-shaped conductors or "hair pins" into a motor armature core. Conductors are made on special presses to the rear of the assembly machine

Where Designed and Built—Once a special machine is thought to be a good investment, a choice of method for designing and building must be made. The facilities available inside the plant will determine whether the equipment will be designed and built inside or outside of the organization.

Years ago special machines were mostly the handiwork of a "mechanical genius." He was generally of middle age or beyond and a skilled mechanic. Most of the machines he produced were for jobs of his own selection and generally were designed personally by him and often built and processed by him. Many of these machines were extraordinarily ingenious and made great improvement in productive methods. These men were mostly rugged individualists and were not open to criticism and assistance. Their ability died with them and the laws of chance were relied upon to replace them.

It was impossible to have several of them in an organization working together. They were not willing to use the services of experts in specific fields, trusting rather to rely on their own experience even where it was inadequate. One unusually capable designer of this type pointed out that the handbook on worm gear speed reducers was obviously wrong since it listed the horsepower output as *less* than the horsepower input. He was not reliable on choice of motors but could design a gear train that was OK. No aspersions are cast on their work, as many of the best special machines are still built by them.

Development Organization—General method today is the use of the development organization. This may be a part of the plant which is to be the user of the special machine, or it may be a nonaffiliated company. The more complete the knowledge of modern arts and facilities that is em- (*Please turn to Page* 110)

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NUMBER 21 OF SERIES

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Production of HIGH ALLOY STEEL CASTINGS

High alloy steel casting business is not restricted to any particular type of composition. Bulk of the production contains a reasonably high percentage of nickel, chromium and iron, however, newer alloys are constantly being developed even with a low percentage of iron, which will meet demands of severe corrosion service and high temperature applications

By W. H. WORRILOW
President
Lebanon Steel Foundry
Lebanon, Pa.

PART I

THE STORY of the production of high alloy steel castings might properly be presented in two parts. It is concerned with current operations in alloy steel foundries producing heat and corrosion-resistant steels, and also with the history of one of America's youngest and most rapidly-developing industries. Thus, a division will accordingly be made in the discussion of this subject.

Manufacture of high alloy steel castings in the United States is relatively new. The melting of alloy steels in a high frequency induction coil furnace was first done about 1926. This type furnace is superior to an arc furnace for alloy steel melting, mainly because of the absence of carbon electrodes, which introduce a higher carbon content than is often desired in alloy steel, particularly in low carbon grades, which are essential in corrosion-resistant steels. However, the arc furnace is still used satisfactorily with certain grades of alloy steels.

For purposes of clarification, high alloy steel castings may be described as castings containing 8 per cent or more of various alloying elements, such as chromium, nickel, manganese, copper, etc. and those containing less are classified as low alloys.

In production of high alloy steel castings, control has always been an important factor; for this reason check points are established along the production line from time of arrival of the furnace scrap, to time of shipment of the castings. A review of these check points will provide an insight into the production methods employed in the alloy steel casting industry today.

Initial check point in the production line pertains to a thorough examination of incoming materials which serve as the furnace charge. A sampling is made of each incoming base metal employed to insure that ingredients are as required, and that other objectionable foreign elements are absent.

A second check point is the careful examination of incoming patterns to verify that they have been designed properly and made to the correct dimensions (which allow for shrinkage).

The pattern next goes to the planning department where the engineering staff studies and plans such heading and gating as will assure proper soundness.

Upon completion of this step the pattern is sent to the molding department to be molded in sand. Any core boxes required are sent to the core room, along with gages used to measure the finished core.

After the mold is completed, cores, if any, are inserted in the cavity and a trial closing is made. This is done to determine that no loose sand has been chipped from the cope by an ill-fitting core or mold. A final closing is then made.

Fig. 1—Metal being poured from electric arc furnace

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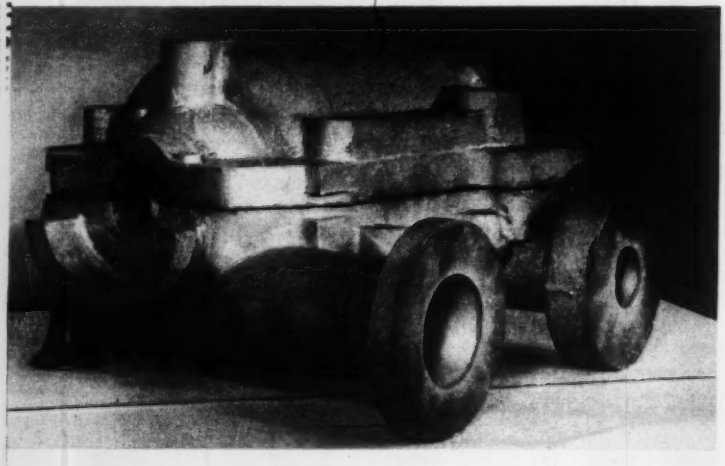
STEEL CASTINGS



In the meantime a high frequency induction coil furnace has been charged for the heat.

Next operation is pouring of the metal. Periodic pyrometer readings are taken while the metal is being prepared for pouring at the proper temperature.

Following pouring and solidification of the casting, it is conveyed to a shakeout for separation from the flask and sand. Sand chipping and blasting follow, after which both heads and risers are removed by either one of the following methods: Arc burning, torch cutting, or mechanical saw. Any protrusion of risers and gates are then ground to the contour of the design.

The next check point is reached in the form of inspection. An inspector carefully examines the casting for surface defects, which are then chipped out, ground and welded by controlled methods. If the casting is to be used for certain types of heat-resistant service, heat-treating operations are generally omitted.

Castings are heat treated in specially constructed furnaces under controlled temperature conditions. They are brought to a prescribed temperature and allowed to soak, usually for a period of one hour per inch for maximum metal section of the casting being heat treated. Austenitic high alloy steel castings are usually given a solution annealing heat treatment at about 2000° F, and then rapidly cooled, usually by quenching in water. The high temperature treatment and rapid quenching impart maximum corrosion resistance. Other forms of heat treatment are often

Fig. 2 *(above)—Pouring molten metal from high frequency electric induction furnace*

Fig. 3 *(left above)—Finished high alloy casting before any machining takes place*

Fig. 4 *(left below)—Stockyard showing piles of furnace plate scrap*

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Fig. 5—Workman checking pattern for design

employed where physical characteristics are of prime importance. This may entail a secondary heat treatment performed at a lower temperature.

Heat treatment produces a mild scale, or oxide film, on the casting surface which is then removed by blasting or acid pickling, or a combination of these operations. This leaves the casting in a well cleaned condition for final visual surface and dimensional inspection.

Providing previous operations have been adequate, the casting should then be ready for shipment or further nondestructive testing, if required.

In addition to the direct procedure just described, there are many indirect services that go into the making of quality high alloy steel castings.

Of first importance among such services are the preparation and control of molding and core sands. A molding sand must be appropriate for the metal being poured. It must be properly milled and tested to insure that its characteristics are maintained.

Core sands must be treated in a like manner, selecting mixtures which produce the desired degree of collapsibility and strength after the casting has been poured, so that excessive resistance does not cause cracking of the casting upon solidification. Baking and drying of cores at controlled temperatures is similarly significant, as is the controlled application of core washes.

Some high alloy steel castings are required to withstand severe service conditions of corrosion or heat, demanding a high degree of casting integrity and soundness. These more critical castings are usually made to strict specifications covering chemical composition, physical requirements, and other specific processing procedure. It is customary that all melts be checked by chemical analysis before shipment.

REPRINTS AVAILABLE

REPRINTS of previous individual chapters in the series "Fundamentals of Steelmaking" now may be obtained by addressing Readers' Service Department, STEEL, 1213 W. Third St., Cleveland 13, O. Prices range from 20 to 75 cents per reprint. Subjects covered over the past few months include:

No. 1, Production of Electric Arc Furnace Steel; No. 2, Scrap Iron and Steel; No. 3, Production of Open Hearth Steel; No. 4, Production of Tool Steel; No. 5, The Art of Roll Pass Design; No. 6, Production of Bessemer Steel; No. 7, Production of Metallurgical Coke and Resultant Coal Chemicals; No. 8, Production of Plates; No. 9, Production of Hot and Cold-Rolled Strip and Sheets; No. 10, Production of Tin Plate; No. 11, Production of Structural Shapes and Rails; No. 12, Production of Butt and Lap Welded Pipe, Conduit and Electric Metallic Tubing; No. 13, Production of Pig Iron; No. 14, Production of Seamless Steel Pipe and Tubes; No. 15, Production of Stainless Steel; No. 16, Iron Ore—Its Mining, Beneficiation and Reserves; No. 17, Transportation and Handling of Iron Ore; No. 18, Production of Wire and Wire Rods; No. 19, Production of Gray Iron Castings; No. 20, Production of Steel Castings.

Fig. 6—Inspector samples all incoming scrap

Fig. 7—View of a molding operation

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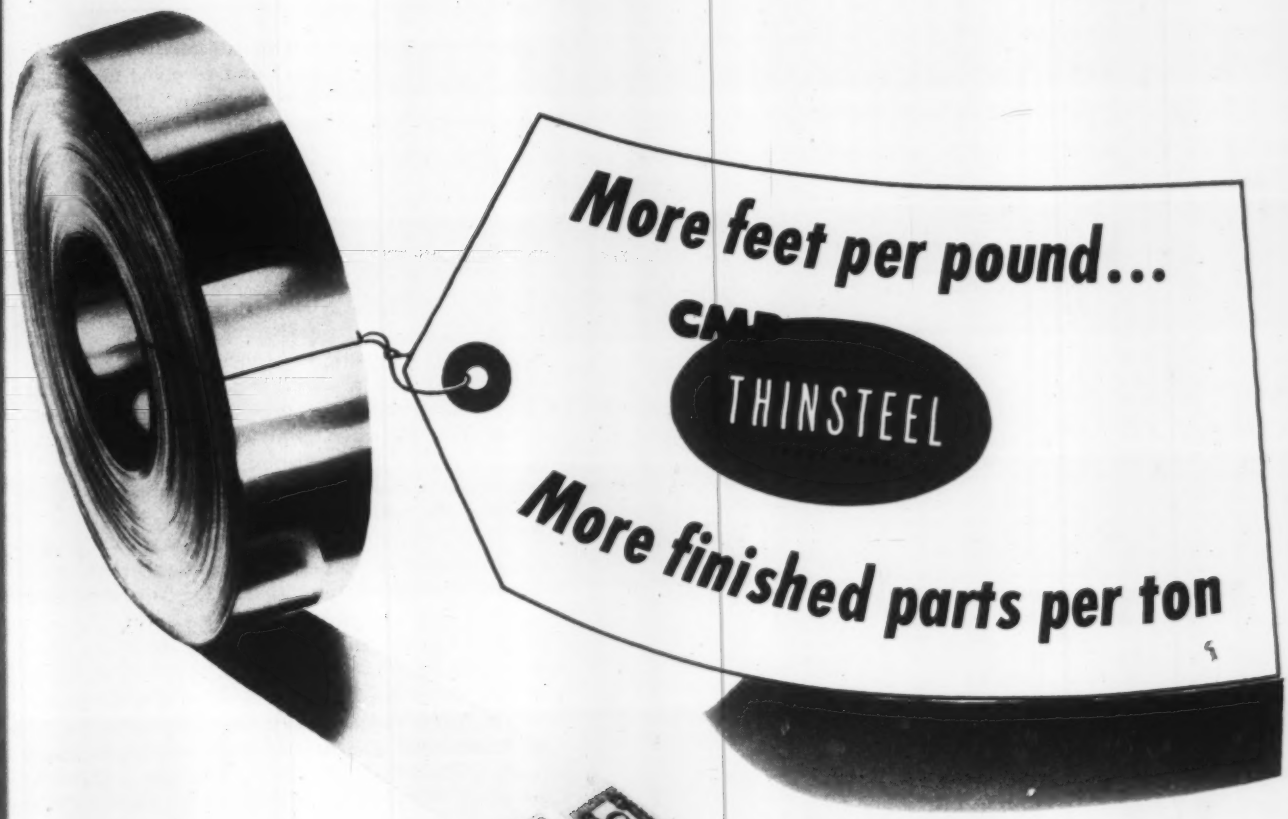

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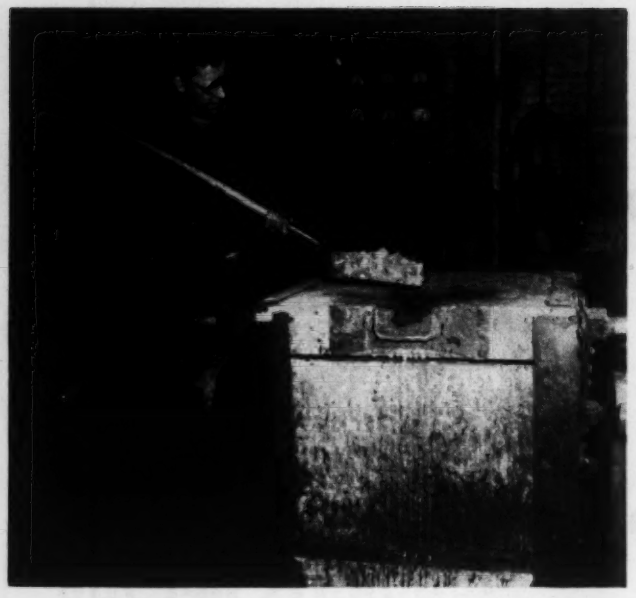
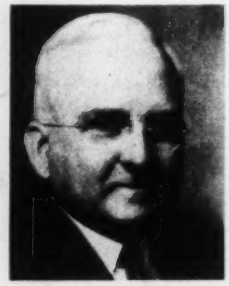


Fig. 8—Charging high frequency furnace for a heat

When required, physical tests are made, commonly determining tensile strength and ductility, along with hardness, impact strength and other physical characteristics.

Specifications for more critical types of castings include nondestructive testing requirements, which may call for examination up to 100 per cent of the product. Radiographic examination is now well accepted by the industry, and is one of the most popular forms of nondestructive testing used on critical cast

Fig. 9—Gaging of cores is one of the important foundry operations



The author was born in 1877 and received his education in the Chester, Pa. schools after which he was employed by the Johnston Railroad Frog & Switch Co. and the Standard Steel Casting Co. both of Chester, Pa. until 1892 at which time he joined the American Steel Casting Co., Pittsburgh, as assistant manager. From 1904 to 1907 he was sales manager of the Solid Steel Casting Co., Chester, Pa., following which he was appointed sales manager of the Lebanon Steel Casting Co., Lebanon, Pa. Four years later he helped organize the Lebanon Steel Foundry, Lebanon, Pa., which organization he has served as president ever since.

He is a director of the Armstrong Cork Co. and was president of the Steel Founders' Society of America during 1931 and 1932. The following year he served as president of the Alloy Casting Association and also of the Alloy Casting Institute from 1940 to 1944.

During World War II he was a member of the Steel & Alloy Casting Advisory Committee of the War Production Board. He was the recipient of a Degree of Doctor of Laws from Lebanon Valley College in 1948. He also received a Distinguished Service Award from American Society of Metals in 1948 for promoting the use of alloy steel castings throughout American industry.

Mr. Worrilow is a member of the Newcomen Society of England, director of the Research Institute of Temple University and a member of the Board of Trustees of Lebanon Valley College. He is vice president of the Pennsylvania German Folklore Society, and a member of both the Pennsylvania German Society and the Huguenot Society of Pennsylvania. He is a vice president and director of the American Ordnance Association, Philadelphia Post, and a member of the Committee on National Defense of the United States Chamber of Commerce.

parts to disclose internal defects and surface discontinuities.

Castings are inspected to conform with mutually accepted radiographic standards before shipment. In addition to radiographic examination, Zyglo inspection is often applied to austenitic types of high alloy steel castings. Zyglo examination discloses only surface defects as the casting is immersed in a compounded oil which penetrates into surface discontinuities. Excess surface oil is washed away, and the casting then examined under a violet (black) light which causes defective areas to fluoresce with brilliance caused by return of the penetrant to the casting's surface.

Magnaflux is another form of nondestructive testing which is applicable only to such high alloy steel castings as come within the magnetic range. It again is limited to surface defects such as cracks, to which it is extremely sensitive. The operation is performed by magnetizing the piece and sprinkling finely-divided iron powder over its surface. The powder collects in a heavy deposit around breaks in magnetic flux,

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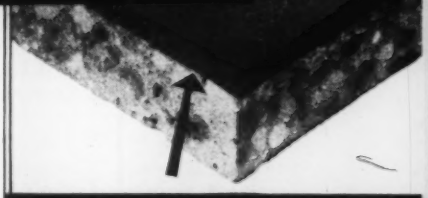
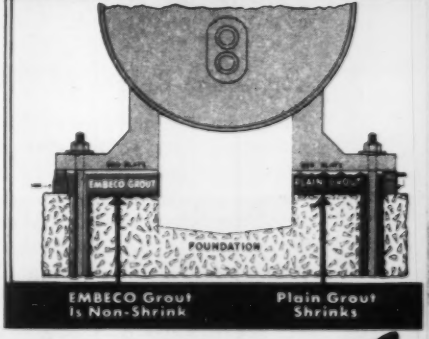


Section of Masterplate Floor. Note Thickness of Armored Surface.



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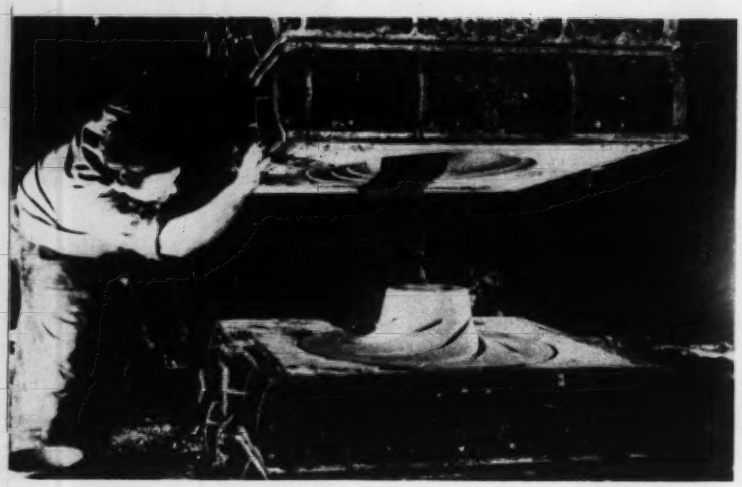

Fig. 10—Trial closing is performed by foundryman

which are caused by cracks or other defects in the piece being tested.

It is conventional to hydrostatically test all pressure-type castings prior to shipment.

Composition of high alloy steel castings varies considerably from grade to grade. Some castings are made to withstand maximum heat and scale resistance under general atmospheres at very high temperatures. Others, under high sulphur conditions are subjected to atmospheres which are reducing as well as oxidizing. No single alloy is completely adequate for such varied types of service, and alloy selection must be made with care.

Corrosion-resistant castings are made to specifications and compositions that may vary considerably from those produced for heat-resistant applications. Some of these alloys are admirably suited to corrosion conditions in which the oxidizing agent may be nitric acid, however, the same alloys may not be suitable for sulphuric acid service.

Selection of composition, therefore requires considerable care and a clean understanding of service requirements.

The high alloy steel casting business is not restricted to any particular type of composition. Bulk of the production contains a reasonably high percentage of nickel, chromium and iron. These alloys, with some modification, meet service requirements for a host of applications, but newer alloys are being developed even with a very low percentage of iron, which will meet the demands of more severe corrosion service as well as high temperature applications.

(To be continued)

Testing Corrugated Boxes

VARIOUS scientific tests and testing equipment used by corrugated box manufacturers to predetermine the efficiency of this type of container in the protection of products in shipment and in storage are described in a booklet, "How To Test Corrugated Shipping Boxes", published by Hinde & Dauch Paper Co., Sandusky, O.

One of a series of packaging and shipping information booklets in the "Little Packaging Library" series, the new booklet lists minimum requirements as established by the consolidated freight classification rule 41 and shows the box user how to get the most for his money in buying corrugated boxes. Described is a classification indicator which tells the proper test weight of corrugated board for use in boxes for products of any size and weight.

Computing Return on Capital

NEW method of computing potential return on capital invested by metalworking manufacturers in new machine tools is presented in booklet form as "Computing Return on Invested Capital, A Study in Machine Tool Arithmetic". Available from National Machine Tool Builders' Association, Cleveland, the method presented in the booklet carries shop computations of annual savings effected by a new machine tool on through the additional computations dealing with depreciation and Federal income taxes, in order to arrive at estimated net return over a ten-year period, the probable profitable life of the new machine. (See STEEL, January 23, 1950, page 61.)

The back of the booklet consists of a work sheet upon which a machine tool salesman, after securing facts as to the increased productivity and the resultant savings which a machine tool may effect in a customer's plant, can then compute simply and rapidly the potential per cent of annual net return on the money to be invested in the new machine.

Brake Gage Makes Four Bends

AS MANY as four different bends in a sheet of metal may be made before it leaves the operator's hands using an automatic, self-indexing rotary type gage for press brakes. A development of General Gas Light Co., Kalamazoo, Mich., it is said to feature ease of setting, accurate gaging and a saving of material handling time.

Called the Rodex gage, it was primarily developed to save time in the company's own factory, but proved to be such a valuable press brake accessory that the company is manufacturing it for other users of similar equipment. Gage consists of a rack and gear assembly which automatically rotates adjustable gage stops into position and holds them securely until the bend has been made.

The rack, which is attached directly to the punch, engages the gears and on the upstroke brings stops to position required for the bend. Provision is made for disengaging the rack from the gears to permit the use of the gage as a single-stop gage. Gage stops are located so as to meet practically any bending requirement.

Requires Ten Freight Cars

IN ORDER to transport a new belt press for the vulcanizing of the largest size conveyor belts, ten freight cars were needed. The most massive mechanical unit in the new belt plant of B. F. Goodrich Co., Akron, O., the 332-ton press was manufactured by Baldwin Locomotive Works, Philadelphia. Said to be the largest of the type ever built, the press has an overall length of over 50 feet, a width of 13 feet, and is 14 feet 7½ inches above the floor and almost 6 feet below the operating floor.

First Microchemical Congress

MAIN purpose of the first International Microchemical Congress, to be held in Graz, Austria, July 2 to 8, 1950, is to assemble the microchemists of the world to mutually discuss and exchange ideas as an incentive to further achievement. It is reported that scientists of 16 countries have accepted the invitation to present papers. An exhibition of microchemical equipment will be presented.

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By JOHN B. BORGADT
Cleveland

Better Welds Expected from

NEW ELECTRIC TUBE WELDING PROCESS

Improved welds, freedom from inclusions, increased wall thickness and greater variety of materials are among the advantages cited for an air-operated intermittent machine which employs surface-contact electrodes to convey current across seam cleft of tube. Successful combination of mechanical and electrical devices produces a good tube weld with fine grain structure almost equal to parent metal

EXPERIMENTAL research and development work has been conducted for many years to construct a low-cost practical tube welder based upon the use of surface-contact electrodes to convey the current across the seam cleft instead of the conventional line-contact disks or roller electrodes. Purpose of the work is three-fold:

1. Investigate and formulate the fundamental principles of surface-contact electrodes applied to electric tube welding. This part was completed in 1939 and the result published in the Mar. 11, 1940 issue of STEEL.

2. Investigate and formulate the welding characteristic, i.e. combination of current, time and pressure required to produce an acceptable continuous weld in preformed tubing of metals and alloys suitable for pipes and tubing.

3. Construct a low-cost effective machine and necessary auxiliaries to produce tubing and pipes commercially.

First attempt to use surface-contact electrodes in tube welding was in 1920. Indications were that a great many advantages could be obtained, such as a better weld—in reality an electric buttweld with all its characteristics; freedom from inclusions and surface contact recurrent welds; and increased wall thickness and greater variety of material. But it was also clear that the problems to solve before an effective workable machine for actually producing tubing were fraught with such tremendous difficulties as to discourage the most optimistic.

Successful Machine—Preliminary experiments indicated the desirability of two somewhat different machines to cover the entire field. Both employ surface-contact electrodes—only method of operation and application differ in details, one being intermittent, the other continuous. For light-gage tubing with wall thickness up to 0.075-inch low-carbon steel, the continuous method appears to be the most suitable and effective, although compared to the intermittent process, power requirement is higher. For wall thickness over 0.075-inch and standard pipes, intermittent is preferable, providing greater flexibility and requiring less power.

Data are not available at present to determine exactly the border line, nor which method is best for alloy steels and stainless steels.

Fig. 1 is an unretouched photo of an air-operated intermittent method machine, designed and built by the author under patents, issued and pending. The experimental research described in this article was made with this machine.

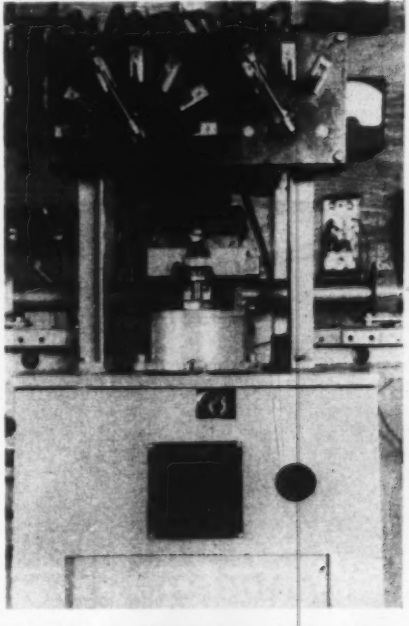

Fig. 1 — Side view of electric welder with 48 kilovolt-ampere transformer capable of producing up to 1⅝-inch tubing

Specifications — Transformer capable of delivering 12,500 amp, intermittent, at voltages from 2.4 to 4.5 open circuit in numerous steps. The primary winding is divided in sections with separate tap switches. This arrangement with electronic and electromagnetic timers provides two current impulses for each operating cycle of any desired length from 3 to 200 cycles in stepless variations. These impulses may be in order of "preheat" followed by "weld" followed by "anneal" as may be required. Only one impulse may also be used. The electrodes are adjustable to provide a distance between from zero to ⅜-inch in order to meet the requirements of various metals, and are supported in such a way that they have a movement all their own, superimposed on the movement of the upsetting jaws. The edges adjacent to the seam cleft move slightly toward the center of the tubing during the upset which causes the abutting edges of the tube wall to heat uniformly in radial direction with equal small flash or upset on the inside as on the outside in the completed weld.

This movement, also, imparts a slight wiping action of the electrodes, which not only maintains, but actually improves contact between electrodes and tube stock during entire weld period. This feature, which is adjustable, is of considerable importance in welding heavier wall tubing, because the impedance of the circuit causes the heating effect to concentrate on the outside of the tubing which is the inside of the circuit, and causes spongy weld toward the outside, as well as unnecessary large flash.

The upset is not affected by rollers which tend to mar and squash the tubing in a horizontal direction, opening up the weld on the outside. Instead the upset jaws are actuated by a system of levers pivoted around

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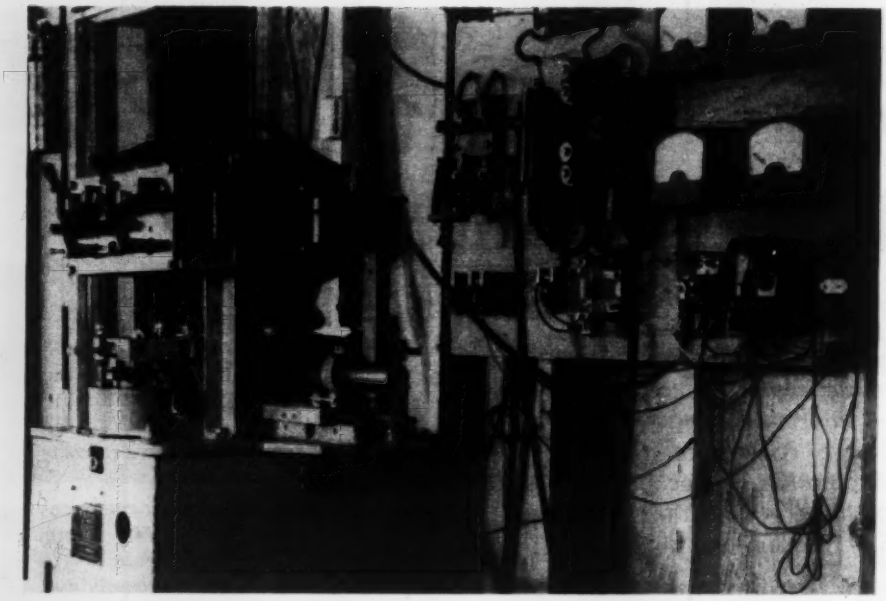

Fig. 2—Rugged welded construction and simple and electronic relays provide many combinations

a point located in the lower side of the tube wall. The upset pressure is under accurate control and synchronized with the heating effect. If a suitable amount is allowed in the forming for upset, the resultant tubing is perfectly round, or nearly so. Upsetting pressure on this particular machine is provided by air cylinders up to 5400 pounds in the seam cleft. Feed is also by air cylinder. It has been satisfactory although hydraulic pressure should be far better suited for the purpose.

Welded Construction—The machine of welded construction, with the exception of current carrying parts, is simple and rugged, and is provided with electric and air controls and meters. Not only has the surface-contact electrodes idea been developed to a successful workable machine, but an entirely new tube weld has been produced; a fine grain structure has been increased considerably, though to what extent has not been determined as yet. Indications are that the greatest parts of pipes and tubing used could be welded by this methed. Fig. 2 shows the entire setup.

Since tubings are required in many different outside diameters and wall thicknesses, efforts have been made to simplify and lower the cost of the different parts required for a given outside diameter. Requirements include one pair of electrodes, one split bushing for upset, two split bushings for feed, one mandrel to prevent collapse and deformation. Expensive rollers have been eliminated completely. Parts also are easily and quickly exchanged. To determine the welding characteristics, the best and most economical combination the author has worked out is a method whereby these may be found accurately without waste of material. From data thus secured, a machine may be designed and built economically to suit any given tubing and production.

Increasing Strength of Weld: Although a tube weld made by the surface-contact electrode method is excellent, in case sheared stock is used, no safety factor is provided for, nor any allowance made for misalignment of the edges.

In order to improve these conditions, a series of experiments were made by increasing the upset pressure sufficient to mushroom the edges either before or after the welding operation. If done before, a low heat is required. Results in the many attempts were not good, the weld was not always the fine grain equal parent metal weld that may be expected. An undesirable ridge was also left on the outside along the seam cleft, after the finishing operation, since the upset largely occurs on the outside. All these objectionable features are eliminated by using specially-formed strip or skelp.

Edges are thickened slightly in the rolling and the contour made such that when the strip has been formed into tubing, the additional stock forms a segment of a circle on the inside, but the outside remains round. This provides the extra strength in the seam without affecting the finished tubing except the small flat on the inside. An increase of 5 to 6 per cent is sufficient to provide for error in welding or misalignment of the abutting edges; 10 per cent is more than ample. As an example in a 2-inch standard pipe, the flat along the seam is less than ⅜-inch. Somewhat similar effect may be obtained with sheared stock. In the forming, extra rollers are placed against the edges under pressure to cold upset the edges; in either case the extra cost including current is small compared to the great advantage of an ample safety factor.

Finishing the Tubing: Although the flash formed is comparatively small, and may be disposed of readily by rolling or any other method, the author developed another modified method of broaching and burnishing to finish the tubing. The flash is cut away gradually until it is flush with the tube stock; any tool marks are removed by burnishing in the same operation, leaving a smooth bright

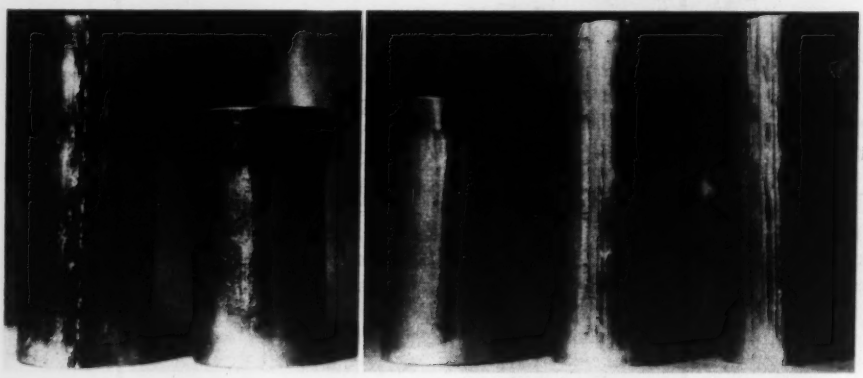

Fig. 3 (left)—Tube samples showing narrow bead caused by the upset, and freedom from discoloration and deformation. Material is SAE 1010 steel

Fig. 4 (right)—Stainless steel samples show effects similar to those shown in Fig. 3

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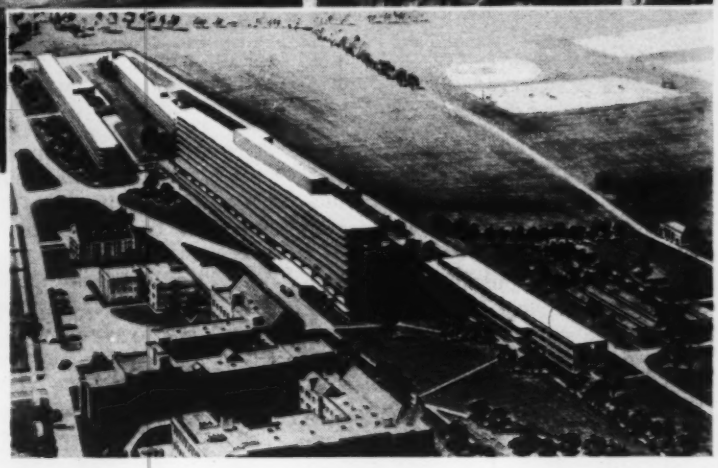

When completed, the new medical center will be one of the most elaborately equipped in the country. Architects—Skidmore, Owings & Merrill, Chicago, Ill.

Workmen level one of the 1772 panels of J&L Steel Radiant Heating Pipe to be used in Ohio State's new medical center.

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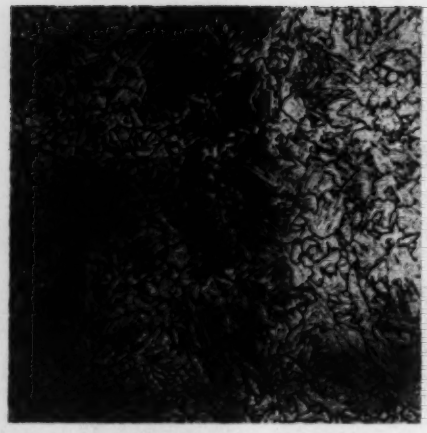
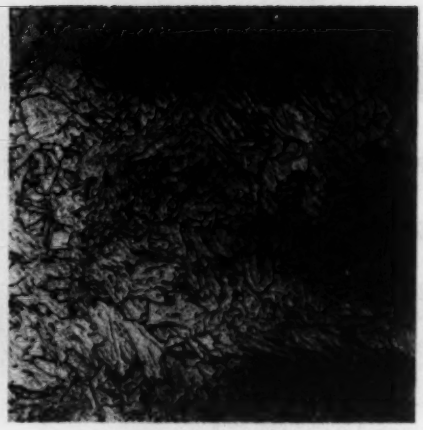




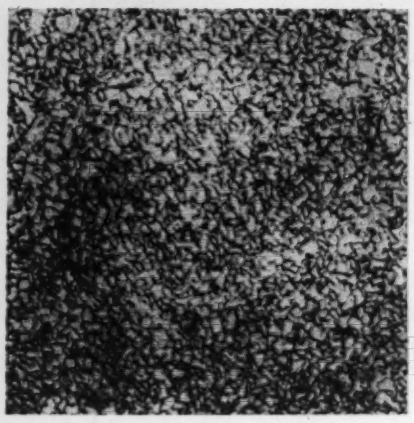


Fig. 5—(upper left)—Photomicrograph of tube weld made by surface-contact electrodes. X100.

Fig. 6 (right)—Weld shows close co-ordination of current and its duration, closing the seam cleft, final upset and cooling. X100

Fig. 7 (lower left)—Normalized weld of low alloy steel

surface without trace of weld or discoloration. The tool is self-adjusting to allow for small variation in diameter and deformation that occurs during the welding process.

Electrical Equipment: The electric welding circuit and electronic control will be the subject of a separate article, so only the briefest mention will be made concerning the efforts to improve efficiency, simplify and lower cost. All loose sliding contactors have been eliminated; contact surfaces are silver-plated to reduce losses to a minimum. New type connector between transformer secondary and welding head has been developed, which reduces the contact resistance to practically nothing.

Fig. 3 shows a typical tubing welded on this machine. The narrow, accurately confined weld-zone, and complete absence of transient zone and deformation depict the working this type of weld can withstand when subjected to flaring and other stresses during manufacturing processes. Figs. 5 and 6 indicate the fine grain structure found in the weld. This weld is obtained by the correct metallurgical process followed. The seam cleft is heated to the required welding temperature as rapidly as possible and under pressure consistent with the characteristics of the steel.

A greater latitude in weld is permissible. For ordinary low-carbon steel, for thin wall tubing, a weld time of 5 to 40 cycles is satisfactory whereas from 25 cycles up to several seconds heat time is required for medium and heavy grades. It depends largely on the rate of production, the type of weld desired and capacity of the equipment that is available.

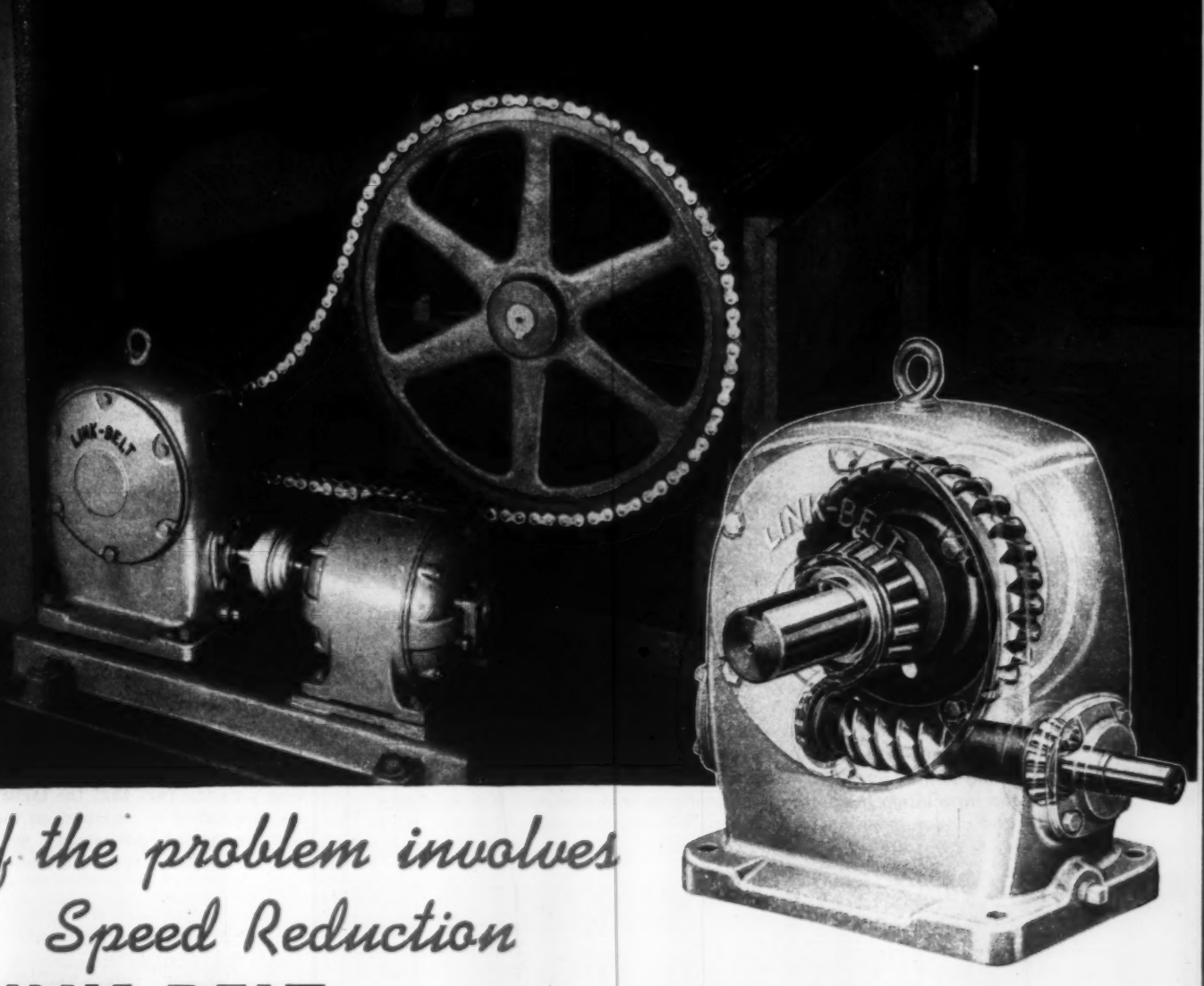
If the heat time may be varied to such extent, the pressure in the welding zone must be regulated to closer limits. During the weld time, pressure of 8000 psi, or nearly so, is desirable. After the heat has reached the desired temperature, current is disconnected and additional pressure is exerted at a rate that coincides with the cooling. For low-carbon steel, the pressure should be 18,000 psi when the temperature of the weld zone has decreased to 1350° F. The cold metal behind the weld zone makes this possible. Thus optimum grain size is obtained. Although the entire cycle (heat, upset and cooling) occurs within a fraction of a second, the mechanical devices controlling feed and upset, electrical controls regulating current and time have been integrated as to operate entirely automatic and accurately. In the thin wall machine, the pressures and regulation thereof are autogeneous.

Stainless Steel: Classified as a high-alloy steel, this type welds readily in tubing and has given excellent results. Welding characteristics differ greatly from mild steel and will be analyzed and discussed separately. The material used is the standard 18-8 type 302, with specifications of carbon 0.10, chromium 18.00, nickel 8.00, tensile strength 89,000 psi, and hardness Brinell 160. Used in the annealed condition, austenitic and nonmagnetic cold-forms readily into fine butted tubing. Melting point of 2550° F is 200° lower than mild steel; specific heat at 0.12 is nearly 10 per cent higher. Thermal conductivity is 0.0062 Btu, or 0.038 centimeter/-gram/second units or 28.5 per cent of steel. Electrical resistance at 410 ohms per centimeter is six times that of steel. Total energy expended in tube welds of a given size is about 20 to 25 per cent less for stainless steel, but an entirely different combination of current and time is required to effect a good weld.

Weld time must be about one-half less and current density correspondingly higher, the primary cause being intergranular corrosion, which will be discussed later. Weld time cannot vary more than one-quarter cycle (1/240 second) for thin wall tubing, and one-half to one full cycle for medium and heavier walls for a given constant current. Heat pressure as well as upset pressure differs radically from mild steel. During the weld time, a pressure of 15,000 psi is followed by an upset pressure of 30,000 to 50,000 psi or higher. Close synchronization is essential because any lag in pressure causes failure. The gap between electrodes must be small as possible. The temperature to coincide with maximum upset pressure to effect the best weld has not been determined.

While the same machine has been used for both mild steel and stainless, the stainless requires a more rugged and smooth working (mechanically) with electronic control to keep weld time and current constant within limits required. This does not present any difficulties, but higher skill and care are essential. Electrodes also require more frequent dressing. Heavier wall thicknesses than the one described have been welded with excellent results.

Intergranular Corrosion: If stainless steel is heated through the range 800 to 1400° F, or cools slowly through the same range, the carbides in the steel precipitate in the grain boundaries, creating continuous paths of corrosion to start and which increase to destructive proportion. The time may vary from a few hours to



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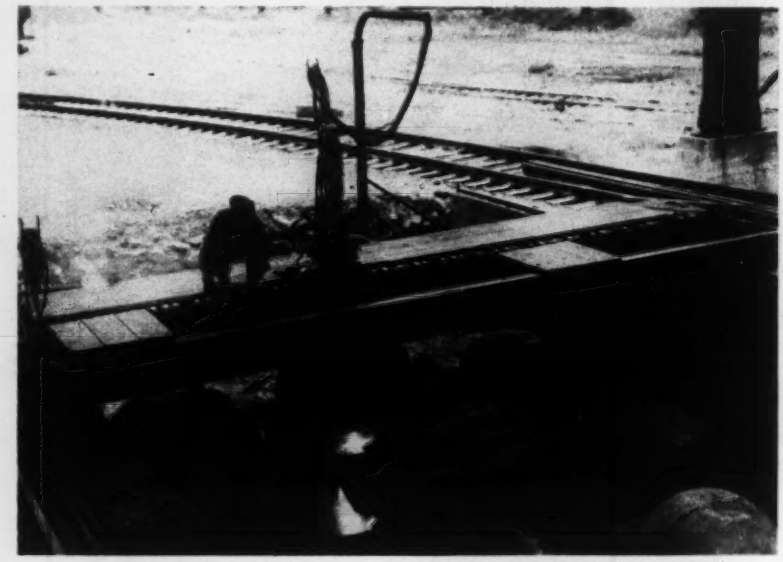

BUTTONS AND BLOWS: Iron-rich powder blown into the cutting-oxygen stream of this cutting blowpipe, said to be the world's largest, transforms slag ladle buttons, spills and off-heat ingots to furnace-charging size with speed and efficiency. An Oxweld C-60 with power cutting attachment, the blowpipe, made by Linde Air Products Co., New York, is mounted on a machine carriage which in turn is mounted on a gantry setup for transverse cutting operations over the entire cutting bed. Operating in the Gibsonton scrap yard of Pittsburgh Steel Co., Monessen, Pa., the installation keeps scrap handling to a minimum. It is said that slag and cinder inclusions are no problem and that sections 6 feet thick may be cut

months depending upon atmospheric conditions. In welding thin or medium wall tubing, the weld period may be assumed to be not over 24 cycles (0.4-second) for both heating and cooling. Since cooling is extremely effective and occurs under pressure, intergranular corrosion has been reduced to minimum by eliminating the carbide precipitation zone.

Low Alloy Steel: This grade has the following approximate analysis: Carbon 0.1%, copper 1.00 and nickel 2 per cent; physical values are tensile strength 90,000 pounds and yield point 75,000 pounds. This steel is easily worked, has exceptionally good welding qualities and high corrosive resistance qualities.

Hot-rolled low alloy steel strips sheared from sheet form readily into tubing. The seam cleft is effectively closed by electric resistance welding using surface-contact electrodes. In welding alloy steel by the resistance method, it must be borne in mind that the alloying elements impart their thermal and electrical qualities on the resulting alloy to a much larger extent than the quantity appears to indicate. Low alloy steel therefore, for a fine grain structure requires a considerably higher current density and more effective cooling than ordinary carbon steel, but also a corresponding higher rate of welding is possible. Otherwise low alloy steel tubing welds in the same manner as low-carbon steel described previously.

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Importance of Stainless

In extra-low carbon range being applied for cost-saving in variety of fields

AFTER approximately two years of service in diversified types of applications the industrial importance of the extra-low carbon stainless steels is being proved. Lower overall costs compared with stabilized grades and greater corrosion resistance adjacent to welds are obtained through the use of these improved stainless steels. First offered to industry as a standard grade by Armco Steel Corp., Middletown, O., in late 1947, these stainless steels are widely used in the chemical, pulp and paper, petroleum and textile industries. Steels of this type have a maximum carbon content of 0.03 per cent as compared to about 0.10 per cent for regular grades.

Use of this grade is said to prevent carbide precipitation during welding, and eliminates possible intergranular corrosion at the weld area. Previously it was frequently necessary to anneal stainless weldments or use the more expensive "stabilized" grades to insure against corrosion in the weld area. Eliminating the annealing of welds has permitted the fabrication of large assemblies on the job and greatly simplified the problem of field repairs on stainless steel equipment.

Offered in types 304, 316 and 317 stainless steels, the extra load carbon grades have the same corrosion resistance as the standard types, plus protection adjacent to welds. According to Armco the greatest demand is for types 316 and 317, these said to have better corrosion resistance than the 18-8 types.

Steel mills have saved money by using these steels for pickling tanks holding nitric acid or nitrohydrofluoric acid solutions. Low initial cost plus the fact that the tanks may be fabricated or repaired on the job are important advantages accruing from the use of type 316 low carbon stainless.

These factors are also said to have made the field useful for welded pipe and pipe fittings in chemical processing plants. Either the stabilized stainless grades or the low carbon grades are required for this use, as annealing after welding is impossible.

It is pointed out that while the carbon content not exceeding 0.03 per cent will prevent harmful carbide precipitation during welding, it will not insure protection at welds and in the parent metal if service temperatures are within the sensitization range of 850 to 1650° F. For this reason Armco states that the low carbon stainless steels should be specified only for welded equipment to be used at temperatures below 800° F.

Welding Electrode Slide Rule

ALL welding rods and electrodes made by General Electric Co., Schenectady, N. Y., are listed on a comparator slide rule which indicates the type of service for which each is designed. All principal manufacturers' electrodes which are the closest equivalents for the application noted for the company's product are also listed. Listings are keyed to AWS classification numbers. Comparison data may be read directly from the slide rule.

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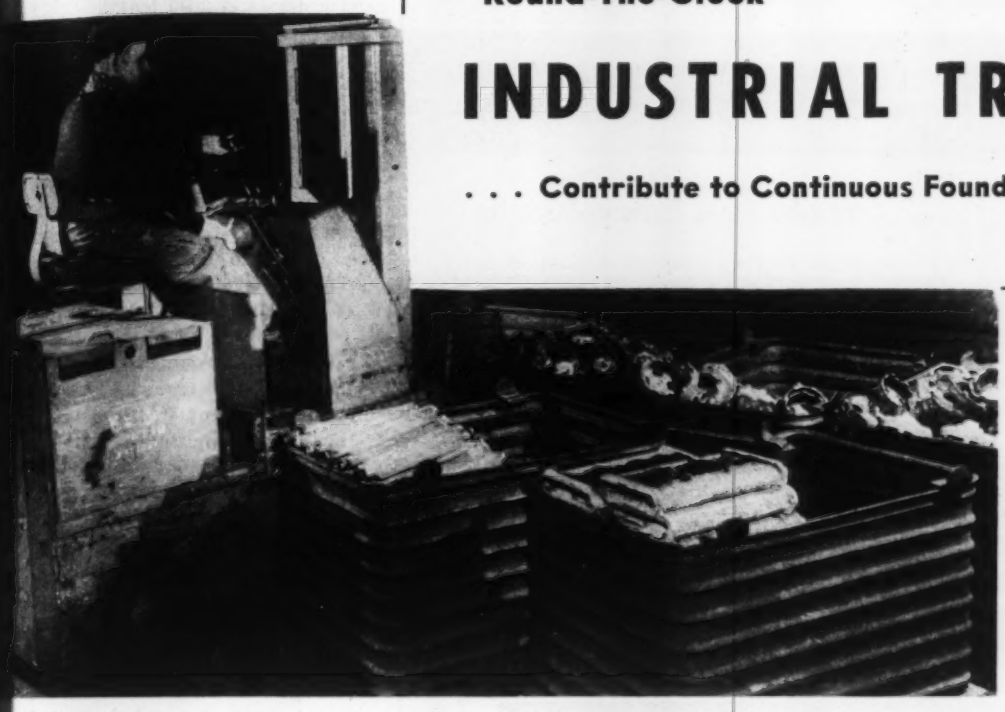


Fig. 1—Center-control type FT truck removing castings in tote boxes from the shake-out conveyor area. Cover over battery of truck has been removed to facilitate battery changing

ATTAINING a dependable process flow, an extremely important factor in any plant, assumes virtually first consideration at Taylor & Boggis Foundry Co., Cleveland, as it is a continuously operating plant. By integrating the use of fork trucks with stationary powered belt conveyors and an extensive overhead conveyor system, material movement has been substantially increased and manual handling cut to a minimum.

In round-the-clock service are three battery-operated fork trucks, one of which is a recently developed center-control type truck. All were built by Baker Industrial Truck Division of Baker-Raulang Co., Cleveland. Of 4000-pound capacity, the new type FT truck is used in every department of the plant, which is over 700 feet long. The continuously operating trucks see service in transferring all of the castings from the foundry proper to the cleaning and inspection departments, as well as performing other associated handling tasks within the plant.

Uprights Quickly Changed—Design of the recently introduced truck includes features which contribute to efficiency, safety and operator convenience. For example, pivot, tilt and hose connections are designed for quick interchangeability of uprights on the job; with two sets of varying heights, it is possible to tier to ceiling height in warehousing and, after changing to shorter uprights, to load or unload box cars or highway trucks. The truck with this feature in use at Taylor & Boggis is equipped with only the high lift uprights, as the highway trucks loaded have open tops.

Continuous operation 24 hours a day is obtained from the foundry's new truck by providing it with spare batteries for the first shift which are exchanged at the end of each 4 hour period. For the remainder of the work day, the 36-v, 500 ampere-hour batteries are changed after each 8-hour period.

During the first shift the new 5-speed truck is constantly removing loaded tote boxes from the shake-out conveyor unloading area. This operation, with the conveyor in the background, is shown in Fig. 1. These loads, averaging about 2200 pounds, are delivered to the cleaning machines (Fig. 2). From the cleaning department they go to the inspec-

Fig. 2—Truck delivering castings to cleaning machines. From here they are moved to inspection, shipping operations

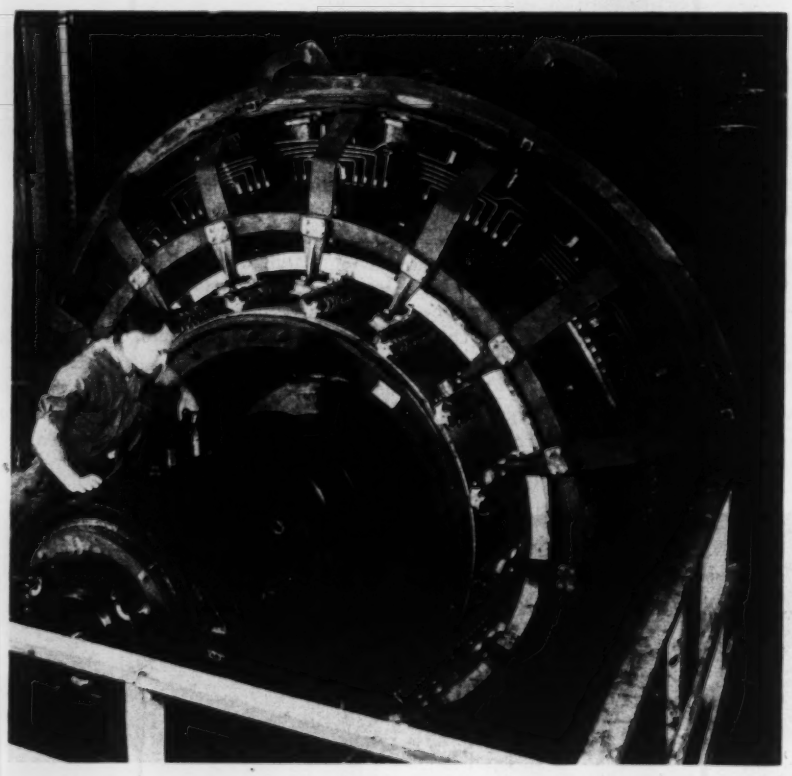
tion department, then to the shipping department.

Maneuverability Important — There are many times during the first shift when the aisles immediately adjacent to the shake-out conveyor and those leading to the cleaning machines present much congestion. As these are the periods in which the trucks must take a minimum amount of time to spot their loads, the 73-inch outside turning radius of the new truck and its ability to make right angle turns in 89½ inches plus length of load assumes importance. This crowded condition exists despite the fact that tote boxes are often stacked four-high. The type FT truck has a free lift of 63 inches, single lift of 64 inches and a telescoping lift of 126 inches.

Taylor & Boggis finds that, in addition to increasing the efficiency of material movement in the production department, the three trucks speed the handling of material in receiving and shipping departments. After the castings are inspected they are transferred in tote boxes to the shipping area and tiered there until time of shipment. Available storage space has been doubled in every department of the plant with the use of fork trucks and their tiering operations. All of the castings are shipped via highway carriers which are loaded by means of these trucks.

Welder Parts Exchange Set Up

OLD PARTS may be traded in for factory wound stators, armatures and certain control parts in the newly established welder parts exchange plan of Lincoln Electric Co., Cleveland. Standard prices in effect include trade-in allowance which reduces the cost for these production line factory parts. Service is available through the company's 146 authorized field service shops in principal cities. A directory of the shop and a price list for exchange parts is available from the company.



LARGE TWINS: Largest reversing twin drive unit ever built for the steel mill industry is the claim made for this equipment for a 206-inch, 4-high mill of Lukens Steel Co., Coatesville, Pa. Shown during assembly at General Electric Co., Schenectady, N. Y., it replaces a 15,000 hp twin-tandem cross-compound steam engine. Drive has a continuous torque rating of 1,400,000 pound-feet and a maximum rating of 3,850,000 pound-feet. It consists of two 4000 hp, 30-75 rpm, 600 v reversing motors, one directly connected to the top work roll and the other to the bottom roll of the mill

Deep Drawing Technique

(*Concluded from Page 83*)

of proper diameter and length.

As this reverse draw is made, a hydraulic knockout unit (built as an integral part of the die and contained in the hollow punch) is forced to close by action of the main ram during the final draw. At the time this reverse operation is made, a lower draw ring contacts the work on a hollow punch and follows through on this operation of completing the shell. The lower draw ring is actuated by a hydraulic unit or cushion in the press base.

As the draw is completed, the hollow punch and main ram ascend and a hydraulic knockout strips the shell from the hollow punch, leaving it in the die to be removed from the bottom punch by the lower draw ring and hydraulic cushion.

The main slide, as previously mentioned, energizes the loading equipment, which instantly starts forward to remove the drawn shell, locate a new blank and return to the open position.

Percentage of initial reduction, amount of heat generated in the first reduction, shape of the draw rings in both the flat and hollow punch, stroke action and pressures are all important factors to the success of this reversing operation. Heat produced during the first draw is not enough to injure the dies or the material being worked. These gigantic dies were designed in such a manner that both the wear and draw surfaces may be remachined or replaced at a very nominal cost.

Automatic loading and unloading takes 6 seconds, and the complete cycle of both loader and draw operations requires about 24 seconds.

Shielded Arc Electric Welding Utilized—After the two tank half sections are drawn, they are joined by shielded arc electric welding. Only operations necessary before welding are trimming, necking and an annealing of a section about 1 inch back from each tank edge which is to be joined during welding.

Scaife Co. is using a HPM hydraulic press of 750 tons capacity, however, any double-action press having a cushion in the base and affording sufficient daylight and stroke to justify the depth of the part being produced can be utilized. High-tensile, deep drawing steel of about 70,000 psi is being used for the tank half-sections, but any ordinary deep drawing quality is workable.

Other drawers who will soon use this type handling and die setup are the Sheffield Steel Corp. and the Weatherhead Co. of Cleveland.

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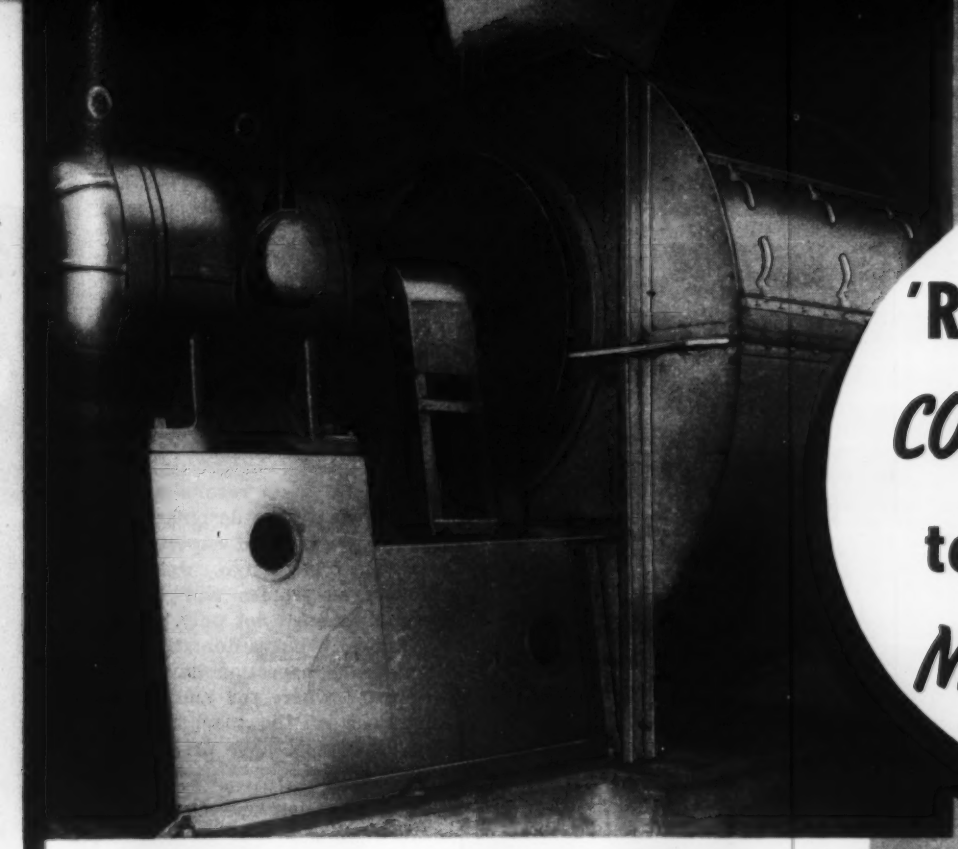

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RUGGED CONSTRUCTION THAT PAYS OFF!

Yes, a mill motor fan has to operate continuously under conditions of heat and often, high pressures. That's why rugged "Buffalo" fan construction pays off. Housings are rigid, of heavy plate, blades are stiff. Shafts and bearings are heavy to stand the service. Note the sturdy motor and bearing stand shown in the photo above. For efficient motor cooling—and added years of repair-free service—"Buffalo" Mill Motor Fans are your cheapest cooling service! WRITE TODAY FOR THE FACTS.

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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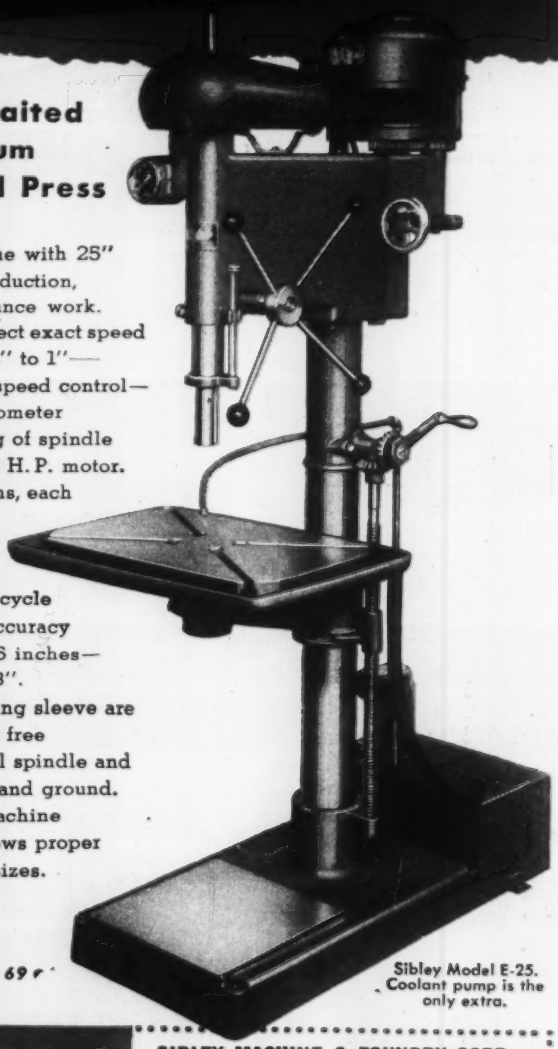
Fills long awaited need for medium weight Drill Press

Sensitive drilling machine with 25" swing for high speed production, yet suitable for maintenance work. Variable speed drive—select exact speed for any size drill from 1/8" to 1"—self-locking, convenient speed control—no belts to change—tachometer provides accurate reading of spindle speeds. Powered with 1½ H.P. motor. Five spindle speed options, each with a 4 to 1 range from a low of 206—825 R.P.M., to a high of 540—2160 R.P.M., with 3 phase 60 cycle motor. Oil groove table accuracy maintained to .0007" in 6 inches—maximum spindle travel 8". Splined spindle and driving sleeve are ball bearing equipped for free floating action. Alloy steel spindle and quill precision machined and ground. Column diameter 4½". Machine weight 765 lbs. Chart shows proper speeds for different drill sizes.



Sibley Model E-25. Coolant pump is the only extra.

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Special Machinery

(*Continued from Page* 88)

bodied in this group, the greater the assurance that the special machine will be the best for the job. Mechanical ingenuity is the prime requirement, but it must be guided by a sound knowledge of proved construction. Machines of apparent complexity may be relatively free of trouble if the components are of good design. These designers need to be backed up by experts in individual fields.

Especially good results have been obtained where the designer used the available services of experts in such fields as tool design, welding, hydraulics, electronics and inspection. Assemblies have not only been made mechanically but automatic welding, sorting and inspection have been incorporated where the knowledge and experience of the machine designer alone would not have permitted their intelligent use.

Catching Mistakes—Cheapest place to correct mistakes in special machine building is on the drawing board. Only after layouts are made is it possible to begin to make concrete what has up to this point been an abstract line. When the layout has been completed and before details are made is the best time for a conference. All who are concerned with the construction, design, training and use of the equipment should critically examine the layouts, keeping in mind that "the adverse criticism of a wise man is more to be desired than the enthusiastic approval of a fool."

If this group is handled by a skillful leader, all of the basic faults of the design will be brought out. It may be hard on a sensitive designer, but if the conference leader is a capable salesman he can convince the designer of the long-run advantages of critically examining and modifying the layouts at this time. By including everyone in this meeting who will be involved in making the project a success and endeavoring to incorporate some suggestions from each one, there is assurance that everyone will be favorable to the project and eager for it to be a success. The general feeling must be that the equipment is being built for production supervision and not being forced on them. Selling down the line is as important as selling to management.

A special machine builder must avoid an autocratic "know-it-all" attitude, since to be most successful he must have co-operation, criticism and an open mind for suggestions. He will need all the help he can get, for no matter how carefully the design is

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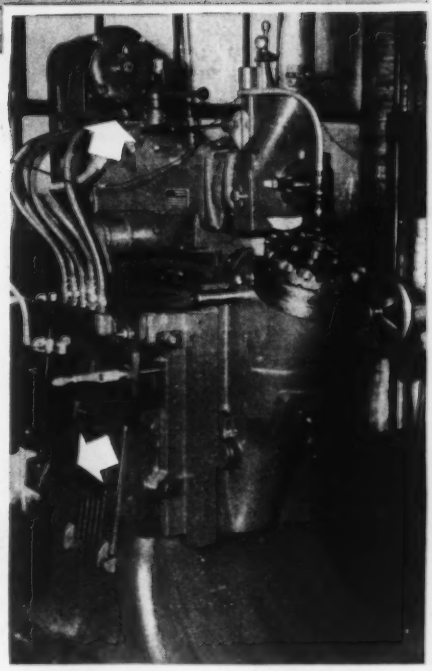

Two Century 1 Horsepower squirrel cage motors driving milling machines in a well-organized shop.

Century MOTORS' ability to start and run smoothly and quietly minimizes the possibility of transmitting vibration to parts being machined. Their remarkable freedom from vibration permits closer tolerances, higher production rates, fewer rejects, lower production costs.

Century motors are built to match the precision of the machines they drive. They are correctly designed, accurately constructed, well-balanced mechanically and electrically, and thoroughly tested.

When you select the right Century motor, you can be sure that it's pre-engineered to meet the requirements of your machine.

It's easy to select the right Century motor for your job because Century motors are built in a wide range of types — in sizes from 1/6 to 400 horsepower — to meet all popular electric power requirements.

Specify Century on all your new equipment — and for replacement. Write for new bulletin on selective speed drives which permit electrically selected optimum speeds.

Popular types of standard ratings are generally available from factory and branch office stocks.

ALTERNATING CURRENT MOTORS

POLYPHASE
- Squirrel Cage Induction — 1/6 to 400 HP
- Wound Rotor Motors — 1 to 350 HP
- Synchronous — 20 to 150 HP
- Split Phase Induction — 1/6, 1/4, 1/3 HP
- Capacitor — 1/6 to 20 HP
- Repulsion Start Induction Brush Lifting — 1/2 to 15 HP

DIRECT CURRENT MOTORS

1/6 to 300 HP

GENERATORS
- AC 500 Watts to 300 KVA
- DC 250 Watts to 200 KW

MOTOR GENERATOR SETS
- AC to DC, AC to AC
- DC to DC, DC to AC

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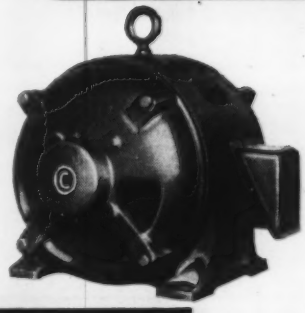

Ball Bearing Motors are factory lubricated for several years' normal service. Bearing housing construction permits easy re-lubrication when unusual service demands it.

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MOTO-TRUC MOTORIZED BATTERY OPERATED WALKIE TRUCKS

HOURS SAVED PER DAY by this crane truck in removing and replacing bearings and pods in large rolling mill.

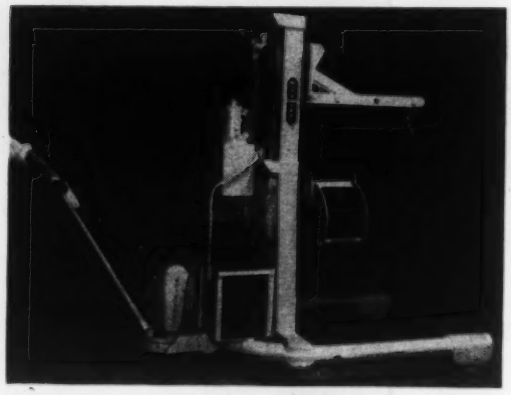
18 Volt Crane Truck

Invaluable for handling roll mill bearings and pods, lifting loads out of pits, handling ladles and many other hard-to-handle loads up to 4,000 pounds.

Easy grip roller type handle contains all controls—two speeds forward and two speeds reverse, and push button lifting and lowering.

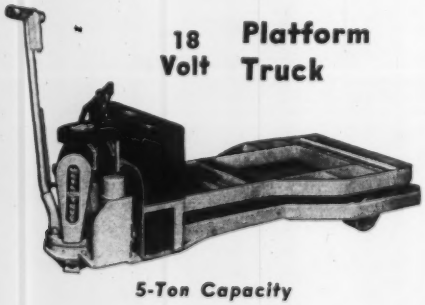
This truck has all the safety features that have Moto-Trucs famous, and is ruggedly built for long service.

Built in various sizes and specifications according to your individual needs. *Tell us the nature of your work.*



2-Ton Capacity

18 Volt Platform Truck



5-Ton Capacity

THIS TRUCK AND ONE MAN IS DOING THE WORK THAT FORMERLY REQUIRED THREE MEN at Large Cast Iron Pipe Mfg. Co.—better and with greater safety.

JOB:—Handling loaded core rack in and out of ovens, where operating space was a factor.

COMPACT POWER UNIT: Only 25" from the front of truck to back of battery. All controls in easy grip roller type handle.

Built to specifications for width and length of load. *Write for Literature*

PALLET, PLATFORM, CRANE AND HI-LIFT TRUCKS

The MOTO-TRUC Co.
1953 E. 59th Street
CLEVELAND 3, OHIO.
ORIGINATORS OF MOTORIZED HAND TRUCKS

made, it is a certainty that it will not work when made exactly according to the drawing. However, it will work, as the patent application said "after numerous trials and repeated failures."

When the design layouts are approved the individual parts are detailed. All the parts should be as simple as possible for ease of manufacture and replacement. Standard parts are used where possible.

Making It Work—Making the machine work requires the highest order of ingenuity and patience. Fully 20 per cent of the cost of the machine will be expended during this period. Special machines are not built by pessimists and they seldom justify the optimism of their builders when first tried out. Two dangers exist at this stage. The first is the tendency to make radical changes in the machine, and the second is an unwillingness to make changes that are actually necessary. Experience and sound judgment are the only guides.

To one who is not in close daily contact with the machine, it would seem that the machine builder does not know what he is doing. Today he knows just what is wrong and tomorrow it is something different. He is always apparently just on the verge of getting it into operation. When "bugging" a complicated special machine this may extend over a considerable period, but it is truly remarkable how seldom a skilled development organization will have a complete failure.

When the machine begins to perform with reasonable success it is time to place operators on it and attempt production runs. Control of the machine should be taken from the builder and placed in the hands of the operator trainer. The viewpoint of these two individuals is entirely different. The mechanic is in the business of building machines and it is hard for him finally to finish a machine he has worked on for perhaps months. The operator trainer is only interested in the machine as a means of producing so many parts per hour. He wants to run it as long as it will produce, and resents any shutdown. Some of the failures of the machine to achieve perfection, which would annoy the builder, are of minor importance to him.

His job is to understand people and their movements as well as the machine builder understands the machine and its movements. Production supervision and time study work closely with the trainer, so that the job may be moved out into production and produce at an agreed rate when it is ready. A good operator trainer can get a completed machine

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into a production line in the shortest possible time. In a special machine building organization he is invaluable.

Performance Record Checked — With a reasonable time after the machine is in production, the performance record of the machine is checked to see if the original estimates have been made. This should be as complete in detail as the original cost estimate to which it is compared. Any variations from expected performance should be studied by the design and estimating group and the knowledge added to the fund which has previously been built up.

Fig. 1 shows a machine for automatically welding the seam of a frame for an automotive generator. Although successful in performance, the estimated saving was lessened by failing to consider the increased cost of current and use of arc carbons. Such factors must always be considered in planning the use of special machines. This machine was built when appearance was not considered important.

Machine in Fig. 2 is for automatically winding generator armature coils. The guards have been removed to show the "apparent" complexity of the machine. Although the output is high, only the winding spindle and the index table operate at high speeds. The majority of the parts are moving at low speeds and are subjected to light loads. The device in the upper left hand corner that resembles a dial telephone plate is a series of red glass lenses, behind each of which is a signal light. When trouble occurs, the operator knows at once what part of the machine needs attention.

Use of this machine was made possible by the product engineer who permitted the use of a heat sensitive tape in place of a moistened gummed paper for binding the wires together. Requiring rigid adherence to previous design would have prevented this improvement in productive methods.

Automatic Assembly Machine—A special automatic assembly machine for five different parts is illustrated in Fig. 3. After each part is fed into the assembly, automatic inspection devices check to assure that the part has been fed and properly located. It is impossible for this machine to produce an incomplete assembly. This machine is an excellent example of increased production and improved quality at reduced cost.

The hydraulic press on the left was formerly in use on the same operation. It was incorporated intact in the new special machine, saving considerable design and development cost.

During the training period the operator trainer was able to create such

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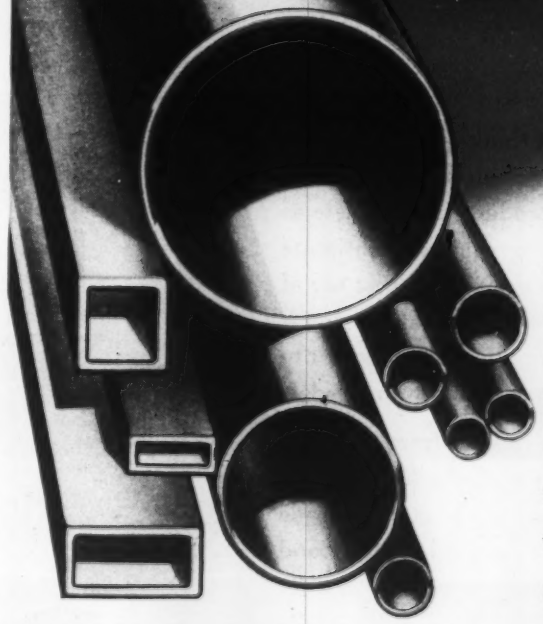

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A Quality Product, can be worked in your plant or prefabricated by MICHIGAN.

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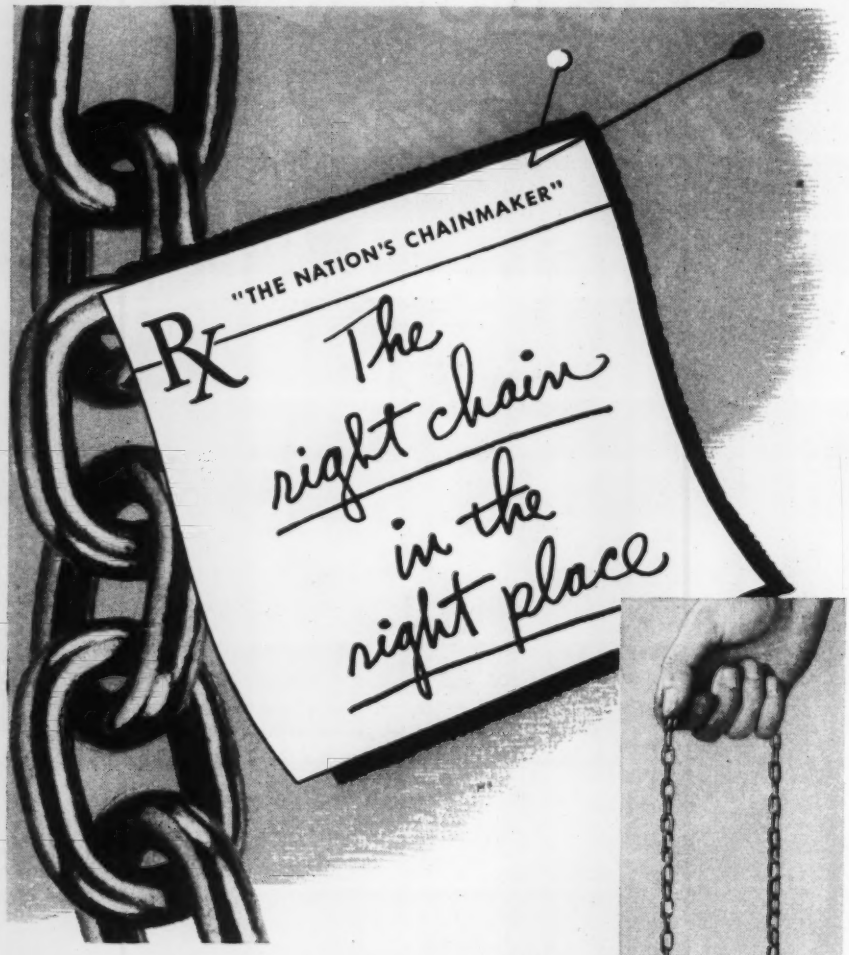

Here at York, we do not think of chain-making as merely a matter of producing tonnage. To offer a line of products as complete as the AMERICAN CHAIN line requires an intimate knowledge of chain design, the best use of alloys, proper heat-treating, galvanizing—plus the necessary machinery and equipment to take full advantage of that knowledge.

AMERICAN makes chain in sizes from that of a ship's anchor chain to that of a fish stringer. But size is only part of the story. A wide selection of patterns, material analyses and finishes—as well as a complete range of fittings and attachments—makes AMERICAN truly the

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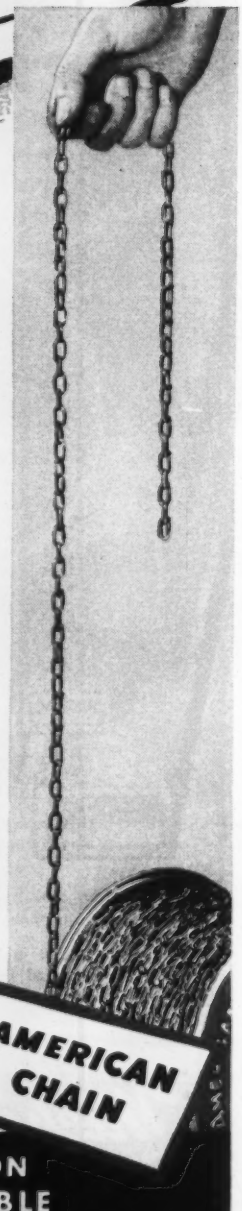

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confidence in his fairness in recommending a reasonable production rate that production operators ran the machine for one 8-hour period at better than 99 per cent of the possible productive capacity. It is doubtful if the machine builder could have followed a "hands off" policy for that length of time or would have developed sufficient interest in the operator to have gained such co-operation.

The two-spindle semiautomatic special machine in Fig. 4 is for boring generator frames shown in front of the machine bases. These are 4½ inches inside diameter. The material is hot rolled low carbon steel. About 0.030-inch stock is removed at an overall cycle of 20 seconds per spindle. Chips and frames are dropped to a conveyor through the base of the machine. The machine is full hydraulic in operation.

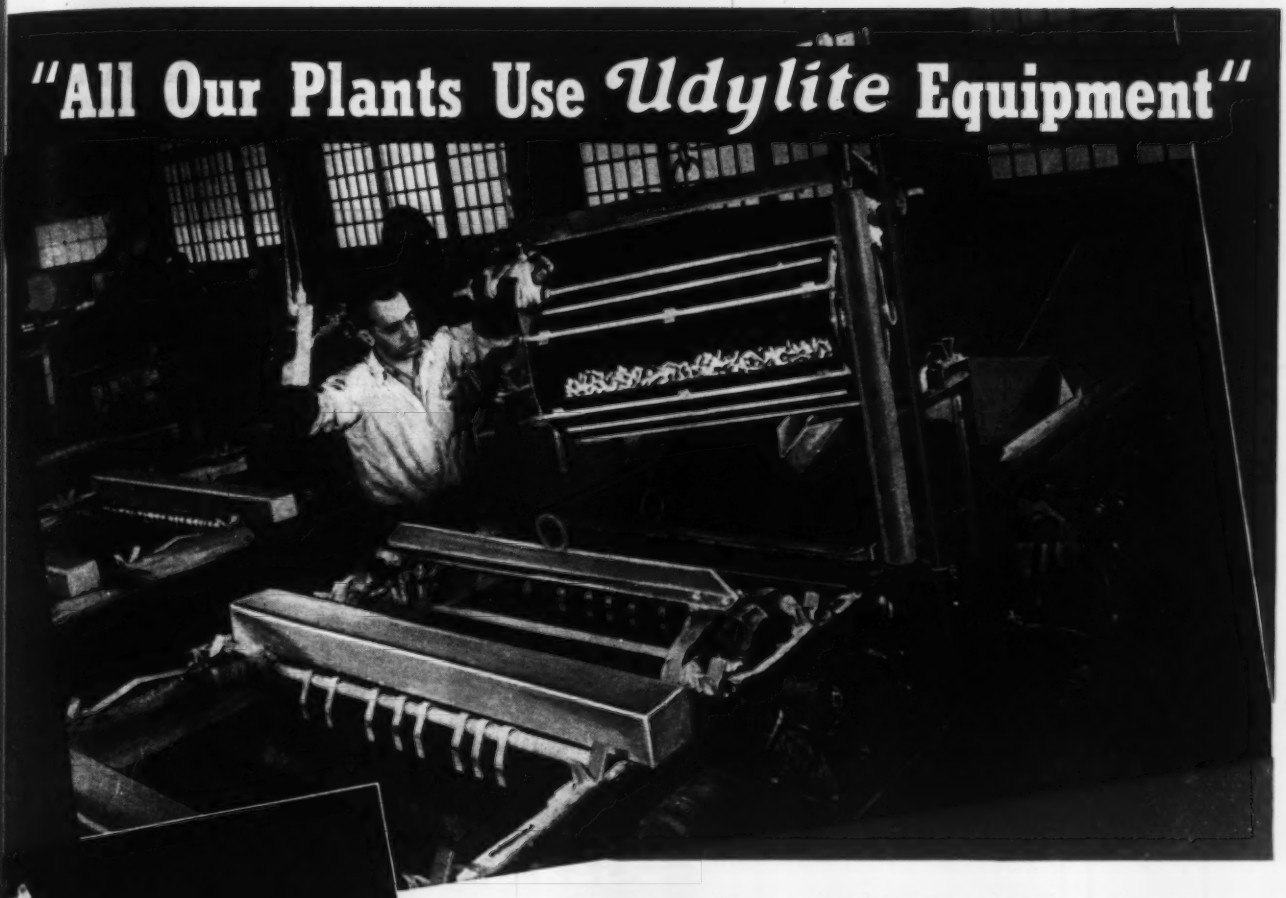
Although these parts weigh about 10 pounds each, the fatigue factor has been reduced by supplying air operated devices to elevate the parts into the chucks and the frames fall to the conveyor below. This machine, although entirely special, was designed and built by a nonaffiliated organization.

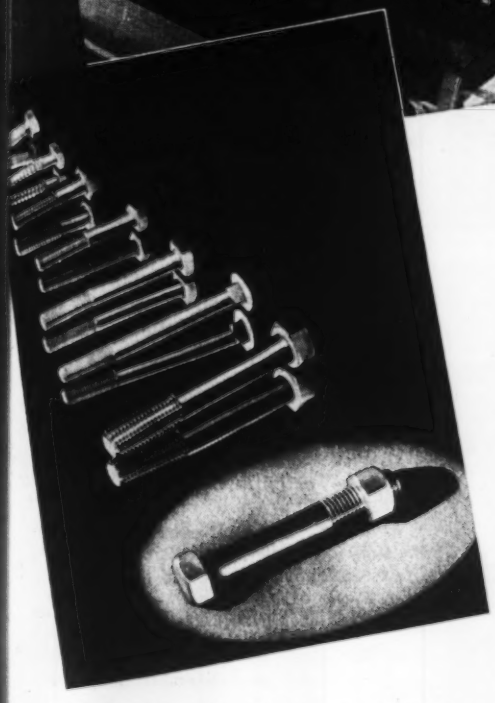
Fig. 5 is a partial view of a special machine for assembling the U shaped conductors or "hair pins" into a motor armature core. The conductors are made on special presses to the rear of the assembly machine. They fall from the press to the inclined conveyor, which discharges them to the chutes leading to the reciprocating slide, which places a conductor at each index of the collector head. Conductor presses are started and stopped by an electric eye which measures the supply of conductors on the chute.

When the required number of conductors is placed in the gathering head, it is swung to the center of the machine, under the ram which presses the cluster of conductors into the core. This ram in the center serves the two gathering heads. This is an excellent example of combined hydraulic and mechanical operation.

This machine required a long period of "bugging" due to an unusual condition. Since each assembly used 23 conductors, a fidelity of 96 per cent would produce 100 per cent defective armatures if properly spaced as one failure in each 23 feeds. Lack of rigidity of the conductors and the high rate of feeding necessary for satisfactory output of the machine caused this to be a difficult problem. It was not one of the type which could be solved on the drawing board. It was a case of numerous trials and repeated failures. The final solution was, as usual, simple and one failure in a thousand was nearly normal.

"All Our Plants Use *Udylite* Equipment"





Products of Russell, Burdsall & Ward Bolt & Nut Co. cadmium-plated by Udylite Barrel equipment at their Port Chester, N. Y., plant. This firm also has plants in Pennsylvania, Illinois and California, all using Udylite equipment.

Says Russell, Burdsall & Ward Bolt & Nut Co.

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They've found both Udylite automatic and barrel equipment give their products better, more uniform metal finishes at lower cost.

Udylite automatic equipment reduces direct labor costs, holds maintenance to a minimum and requires less floor space per unit.

Udylite barrel equipment for cyanide and acid baths, is noted for rugged construction and low-cost operation.

Add up these advantages and you'll see why Udylite plating equipment is your best investment.

In addition, Udylite offers *complete* plating service—before and after installation. If you are planning a new installation or if you face a plating problem with your present equipment—it will pay you well to call in your Udylite Technical Man. He'll be glad to help you at any time—without any obligation. Call him today or write to us direct.

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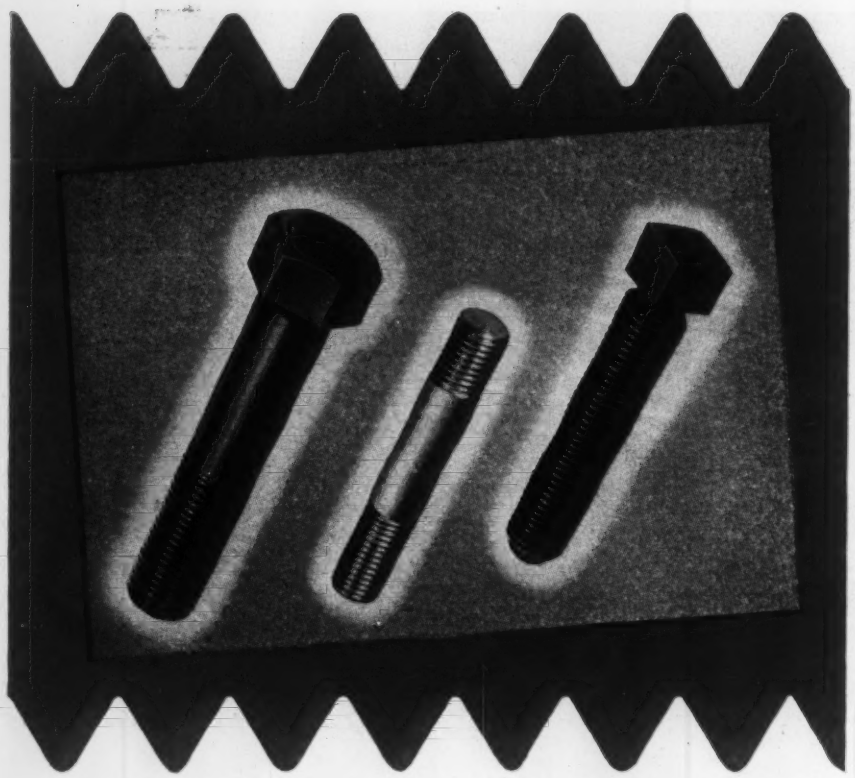

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LETTERS
to the Editors

Grinding, Turning, Handling

We would appreciate receiving from you any published data that you may have in regard to the best grinding, turning and handling practices on work and back up rolls for cold rolling mills.

E. L. Magnus,
Manager, Mill Engineering
Signode Steel Strapping Co.
Chicago, Ill.

Articles on these subjects appeared in the Feb. 2, 1948, April 4, 1949, April 11, 1949, May 16, 1949 and May 23, 1949, issues of STEEL. Tearsheets are being sent.—The Editors

Permanent, No Less

In the Dec. 19, 1949, issue we read an article about a permanent galvanizing kettle that was recently patented according to W. H. Spowers Jr. As we have three kettles in operation in our plant at all times, we are interested in equipment of this kind. I wonder whether you would give me Mr. Spower's address so I can write him direct.

G. F. Roth
Vice President
F. H. Lawson Co.
Cincinnati, O.

The address of Mr. Spowers is 551 Fifth Ave., New York, N. Y.—The Editors

For Key People

Your Jan. 2, 1950, issue carried a story on our Silvercel battery. Inasmuch as we would like to circulate this very interesting account to several key people, we would like to have three clippings of this story which appeared on page 336. We thank you for bringing our battery to the attention of your numerous readers.

Herbert A. Bodkin
Yardney Electric Corp.
New York, N. Y.

We Have No Calendars, But—

We are wondering whether you have available calendar information as to conventions and shows that might be scheduled for the first half of 1951. We are making some plans of our own and do not wish to run into a confliction. If you have this information available, I would greatly appreciate your sending it to me.

Paul W. Evans, Secretary
Beals McCarthy & Rogers Inc.
Buffalo, N. Y.

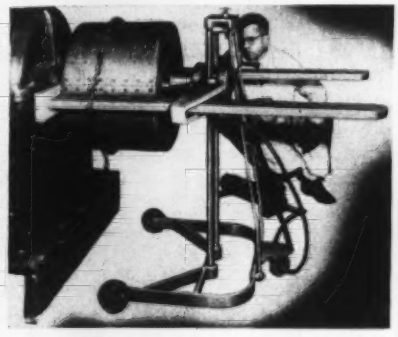
To date we have word of only a few conventions definitely scheduled for the first half of 1951. One is the materials handling exposition in Chicago, April 30 to May 4, 1951. A rough rule-of-thumb that might help you is to consult the 1950 calendar beginning on page 269 of STEEL's Metalworking Yearbook, Jan. 2, 1950. Most 1951 conventions will be on or about the same dates as the 1950 affairs, although usually not in the same city.—The Editors

New Products and Equipment

Portable Pulley Puller

Industrial Engineering Equipment Co., 122 E. Fourth St., Davenport, Iowa, is producing a heavy duty portable hydraulic pulley puller, rated at 50 tons pressure. It is designed to remove large pulleys, wheels, gears, etc., from shafts.

Two feet at the ends of adjustable arms are placed behind the object



to be removed and a ram is placed in position against the end of the shaft. Pressure applied by the ram against the shaft by a hydraulic pack loosens and removes the object without damage. Heat treated alloy steel is used in cross beam, puller arms and feet. Pressure is regulated by a 3-speed hydraulic pump. Pulleys as large as 42 inches in diameter with face width up to 48 inches may be

Check No. 1 on Reply Card for more Details

Box Truck of Aluminum

Because aluminum makes box-type trucks introduced by Tobey Mfg. Corp., El Segundo, Calif., light weight, more pay-loads can be carried with less worker strain. Frame is made of high tensile strength aluminum alloy angles, while panels are of aluminum alloy sheet and flush riveted.

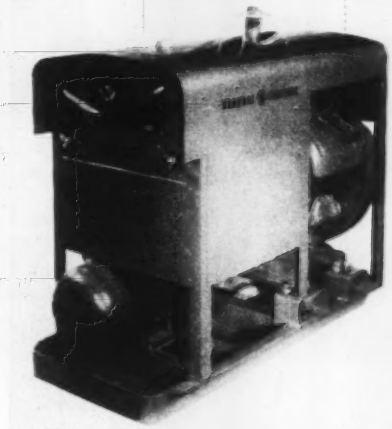
The nonmagnetic and nonsparking trucks are available in various sizes and capacities to meet individual requirements. A truck measuring 24 x 48 x 33 inches weighs 95 pounds. They may be ordered with one or more sides hinged and completely collapsible for easy stacking.

Check No. 2 on Reply Card for more Details

Mobile Arc Welders

Lightweight mobile engine-driven direct current arc welders are included in the WD-40 Series announced by General Electric Co., Schenectady 5, N. Y. Model WD-42AGW (illustrated) is driven by a 31-hp Wisconsin air-cooled engine with magneto ignition and has a rated output of 200 amp at 40 v for heavier-duty welding jobs. Powered by a six-cylinder Chrysler industrial engine of 63 hp are models WD-43AG and WD-44AG which have outputs of 300 and 80 to 500 amp, respectively. Both are equipped with belt-driven governors to prevent engine overspeeding and an automatic slow-down device to save gas.

There are four welders in the diesel-drive line, the WD-43ADGM and WD-43ADC being powered with General Motors and Caterpillar diesel engines and having a welding range of 60 to 375 amp. Models WD-



44ADGM and WD-44ADC have a welding range of 80 to 500 amp and have General Motors and Caterpillar diesel engines.

Check No. 3 on Reply Card for more Details

Pump or Motor Coupling

An adaptation of the Magic-Grip sheave principle is the Magic-Grip coupling for the shafts of pumps or motors, announced by Allis-Chalmers Mfg. Co., Milwaukee, Wis. Interchangeable with the old standard coupling, it is available in two bore sizes, ⅝ and 2⅛ inches, both taking up to 120 hp at 3550 rpm. Coupling consists of two cast iron disks with tapered bores, rubber covered tubes assembled on studs, split tapered bushings and two set screws for each disk.

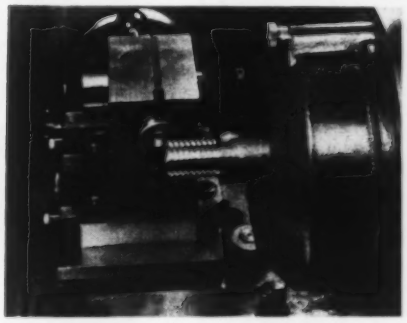
Four drilled recesses in the bushing accommodate the "off" and "on" positions of the set screw driving holes of the coupling. The holes in the bushing are offset so that when set screws contact them a force is applied in either direction to drive the tapers of the two pieces tighter or looser. Normal tightening is all that is needed as both bushing and coupling are machined so that excess pressure is unnecessary to secure the complete unit to the shaft. In dismantling the procedure is reversed.

Check No. 4 on Reply Card for more Details

Attachment Simplifies Threading

A retractible threading tool holder for use on the cross-slide of turret lathes made by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O., automatically withdraws the tool from the work at any desired point, permitting cuts at full speed close up to shoulders without close attention by the operator. Attachment incorporates a spring release mechanism cocked by a handle to move the tool forward and released by an adjustable screw stop attached to the headstock. The stop actuates a cam rod in the attachment to snap the tool back from the work.

Device may be furnished for use at the front of the cross slide, or in a style for use at the rear with extra linkage. The retractible tool holder is used in conjunction with the company's apron-mounted chasing screw attachment which permits any



standard pitch from 4 to 32 to be cut from the square turret. Attachment is applicable to all saddle-type and numbers 3, 4, and 5 universal turret lathes.

Check No. 5 on Reply Card for more Details

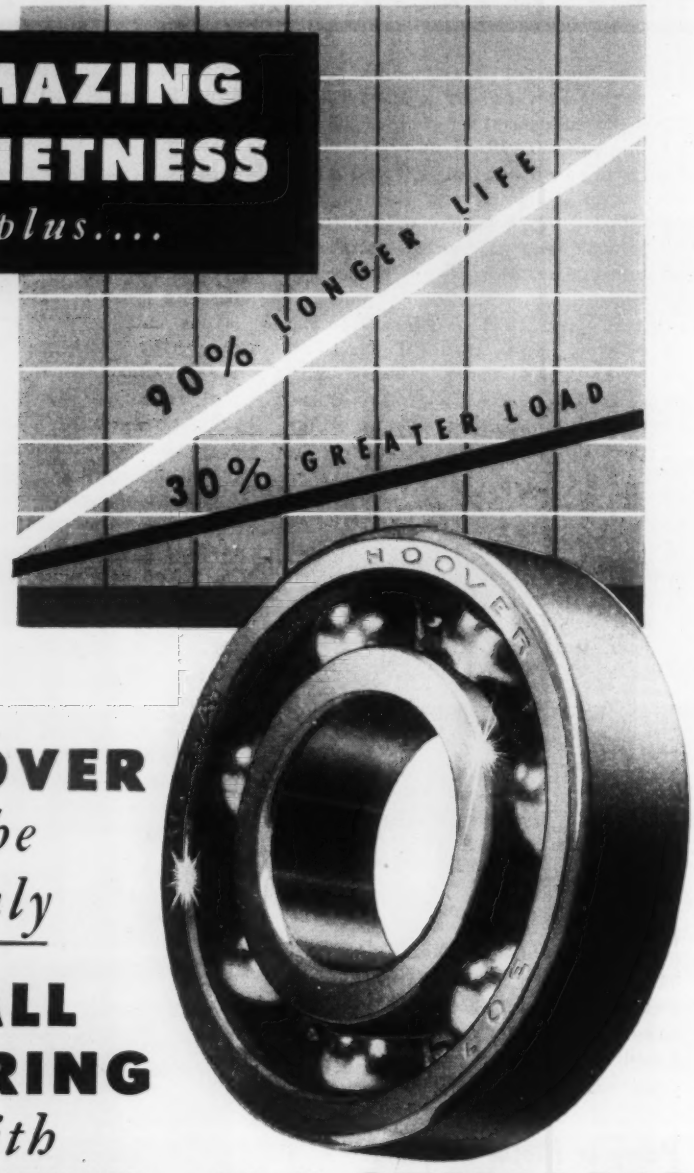
Brake Motor Lubricated For Life

Developed for applications requiring frequent instantaneous stopping and starting, a line of brake motors made by Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., features prelubricated for life cartridge bearings and a brake lining which needs no adjustment. The brake can be mounted on dripproof, splashproof, or totally-enclosed motors to make a matched brakemotor in ratings from 1 to 60 hp.

An advantage of the new brake is the use of bonded metal brake

For Unexcelled Performance

AMAZING QUIETNESS *plus....*



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Here are three pertinent reasons why you should consider Hoover Ball Bearings — with honed raceways. First, these bearings achieve unbelievable quietness. Second, they increase bearing life 90 per cent. Third they have a 30 per cent greater load capacity. When you specify Hoover Ball Bearings you secure these PLUS features without extra cost.

The Hoover Engineering Manual gives all the facts. Write for your copy.

THE ARISTOCRAT OF BEARINGS

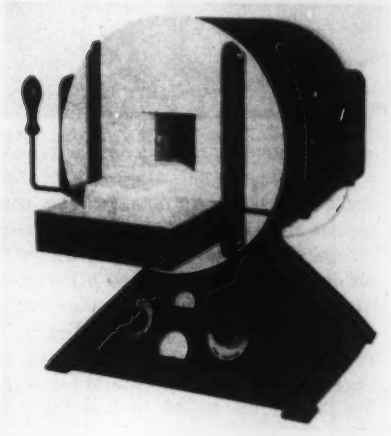
HOOVER BALL and BEARING CO.
Ann Arbor, Michigan

linings which are not affected by heat, cold, dampness, salt water, fungi, grease or oil. The all-metal construction of the disks provides greater wear resistance and eliminates adjustments and replacements for normal applications. Units are available separately for mounting on NEMA standard D flange motors in frames 203-326 or C face motors in frames 364-405 with standard double shaft extensions.

Check No. 6 on Reply Card for more Details

High Temperature Furnace

Demand for temperatures in the operating range of 1700 to 2600° F is met by an electric muffle furnace developed by Hevi Duty Electric Co., Milwaukee 1, Wis. Using Globar heating elements, the furnace is equipped with a ceramic muffle and a manual control provided by a tap-



changing transformer in the furnace base.

Standard equipment includes an ammeter and an indicating pyrometer with noble metal thermocouple. Inside dimensions are 3 x 4¼ x 7 inches and electrical rating is 3500 watts. It is available for 115 v, 60 cycle or 230 v 60 cycle ac.

Check No. 7 on Reply Card for more Details

Motor Is Splash Proof

A motor which retains its splash-proof features when mounted in any position is being made by Sterling Electric Motors Inc., Los Angeles 22, Calif. End bells permit free passage of ventilating air through integrally-cast baffles, preventing liquids reaching the interior of the motor, even though it is located where subject to direct streams of water or other liquids. Air is drawn in through the rear of the motor and exhausted through the shaft end, thereby blowing out foreign materials, water and liquids from the motor and the assembly it is driving.

Labyrinth seals on shaft ends are

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AN IMPORTANT MESSAGE TO METAL WORKERS INTERESTED IN:

SPINNING, BLANKING, STAMPING, MACHINING, ETC.

1. FORM THIN SECTION PARTS OF **LOW CARBON STEEL**
2. HEAT TREAT FORMED PARTS TO *INCREASE* CARBON TO A **MEDIUM OR HIGH CARBON STEEL**

A *New* HEAT TREATMENT

Homogeneous Carburization

Broadens the Scope of Production of Small Metal Parts

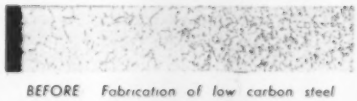
In homogeneous carburization the carbon content is built up throughout the entire thickness of the steel. The carbon potential of the prepared gas atmosphere is adjusted equal to the carbon desired in the steel. Then the low carbon steel is heated in this atmosphere where the carbon content gradually raises until the equilibrium is established between the atmosphere and the steel being treated.

RX Gas Atmosphere

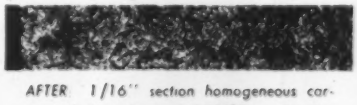
A 'Surface' RX Gas atmosphere is used for the process. 'Surface' RX Gas generators have been used extensively in industry for gas carburizing, dry cyaniding, carbon restoration, and clean hardening. They have proved most satisfactory in operation since they maintain an output of prepared gas atmosphere of constant analysis with a minimum of adjustment and maintenance.

THE PROCESS:

Homogeneous carburization permits the transformation of a low carbon steel into a medium or high carbon steel, in parts of thin section, after fabrication, and oftimes during the final step of heating for hardening.



BEFORE Fabrication of low carbon steel (1/16" section) before heat treatment. 100X—nital etch



AFTER 1/16" section homogeneous carburized throughout at 1700°F. in RX Gas atmosphere with a 0.60% carbon potential. Oil quenched 100X—nital etch.

Continuous or Batch Type Furnaces

Either continuous or batch type furnaces can be used that have a heating chamber suitable for complete exclusion of both air and flue gas. Modern 'Surface' radiant tube heated furnaces, which have the necessary safeguards for good atmosphere control, are most applicable to this new process.

'Surface' Research and Development

The principles of carbon balance which have been so well applied to 'Surface' gas carburizing to permit control of surface carbon concentration, regardless of case depths, have been just as satisfactory adapted to homogeneous carburization at any desired carbon level from low and medium carbon to 1.00% carbon and higher if required.

WRITE FOR COMPLETE DETAILS... NO OBLIGATION

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

'Surface' **INDUSTRIAL FURNACES**

incorporated, assuring protection against entry of liquids into the bearing housings. All bearings are lubricated for life. Motor has a herringbone rotor.

Check No. 8 on Reply Card for more Details

• • •

IDENTIFIES EQUIPMENT: Light and heavy industrial equipment may be quickly identified and classified with markings that cannot wear off, drop off or get lost, with the new Vibro-Tool, made by Handicraft Division, Burgess Battery Co., Lake Zurich, Ill. With a tantalum carbide point, the tool writes on steel or any other metal, plastic, wood, glass or ceramic surfaces.

Check No. 9 on Reply Card for more Details

PREVENTS EXPLOSIONS: Known as Protectoglo, a flame detector that operates on flame rectification principles is announced by Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. It applies alternating current to either a flame-electrode immersed in the flame or to a photocell sighted at the flame.

Check No. 10 on Reply Card for more Details

COATING FOR EQUIPMENT: Dampney Co. of America, Hyde Park, Boston 36, Mass., announces a new silicone coating aluminum for weather exposed service at temperatures to 750° F. It is suited for out-of-doors service in industrially contaminated atmospheres, as well as exposure to atmosphere under shelter and is recommended for application to equipment such as stacks, furnaces, boilers, heaters, ovens, steam lines.

Check No. 11 on Reply Card for more Details

CLEANS GLASSES: Dow Corning Corp., Midland, Mich., offers a metal wall dispenser that holds a normal month's supply of 3 x 7-inch Sight Saver tissues to help employees keep their glasses clean. Tissues are impregnated with the company's special silicone.

Check No. 12 on Reply Card for more Details

TROUBLE LIGHT: Magic Lite, introduced by Lincoln Park Industries Inc., Jamestown, N. Y., has a permanent Alnico V magnetic base which permits the light to be attached to any ferrous surface. It has a universal ball swivel joint that permits light to be turned in all directions.

Check No. 13 on Reply Card for more Details

SUPPORTS CENTERLESS SHAFTS: A new female live center designed specially for supporting centerless shafts is available from South Bend Lathe Works, South Bend 22, Ind. Two sizes are available, one with No. 3 Morse taper shank and maximum work capacity of 1 inch, and other with a No. 2 Morse taper shank and ¾-inch work capacity. Both sizes will take work diameters down to 5/16-inch.

Check No. 14 on Reply Card for more Details

TAMPER-PROOF COUNTERS: Silver King mechanical counters, made by Production Instrument Co., Chicago 6, Ill., are heavy duty stroke counters for industrial applications such as punch presses, drill presses, milling machines, etc. A built-in device prevents reverse operation of the reset mechanism.

Check No. 15 on Reply Card for more Details

CAR THAWER: J. C. Corrigan Co. Inc., Boston 22, Mass. offers a new improved De-Icer that thaws out frozen coal or similar material in steel railroad cars. One man can slide it under the car pocket where it snaps on to the rails. No. 2 oil is used in the trough.

Check No. 16 on Reply Card for more Details

CUT INSTALLATION TIME: Offset conduit nipples, made by Gedney Electric Co., New York 20, N. Y., are easy to use and result in a neater installation where box knockouts do not line up. They also permit perfect alignment of ganged distribution boxes, pull boxes, switch enclosures, etc. Sizes available are ½, ¾, 1, 1¼, 1½ and 2 inches.

Check No. 17 on Reply Card for more Details

DUST FILTER: By frequent applications of blasts of reverse air, the new filter made by W. W. Sly Mfg. Co., Cleveland 2, O., prevents the accumulation of dust on cloth bags. Blasts are created by main fan of the dust control system. All shaking mechanism has been eliminated. Shutdowns, shaking or flexing are not necessary to remove dust.

Check No. 18 on Reply Card for more Details

HYDRAULIC CYLINDERS: Northern Tool & Machine Co., Melrose Park, Ill., has developed a new line of single and/or double action high pressure hydraulic cylinders. Designed for working pressures of 4000 psi, in a range from 5 to 60 tons, cylinders are all steel with hard chrome finished moving parts.

Check No. 19 on Reply Card for more Details

ELIMINATES SEPARATE SETUPS: An automatic roll marker that permits die marking of screw machine parts during the machine cycle is offered by New Method Steel Stamps Inc., Detroit 7, Mich. Suitable for light and heavy work on both automatic and hand operated screw machines, bench and turret lathes, etc., it eliminates the need for separate setups for marking.

Check No. 20 on Reply Card for more Details

LENGTHENS CHAIN DRIVE LIFE: Roller chain drive life can be lengthened through the proper use of Baldwin-Rex improved tooth form sprokets introduced by Chain Belt Co., Milwaukee 4, Wis. Advantages of these sprockets are: All teeth in arc of contact share in the load for entire life of chain; longer tooth form will handle more pitch elongation; gap angle is a predetermined variable.

Check No. 21 on Reply Card for more Details

FOR SAFETY MESSAGES: Mine Safety Appliances Co., Pittsburgh 8, Pa., offers the Flash-O-Graph for attracting attention of workers to safety messages. Messages are spelled out in bright dots of light which move along continuously. Flashing action is provided by a replaceable, endless perforated tape which is illuminated by a fluorescent lamp. Fifty-two standard tape messages are available.

Check No. 22 on Reply Card for more Details

PORTABLE THREADER: Features of the Quijada Chief, introduced by Quijada Tool Co. Inc., Los Angeles, Calif., include four jaws, front, that automatically grip the pipe and four jaws, rear, that automatically center pipe to eliminate whipping even on smaller sizes. The ½ to 2-inch portable pipe and bolt threader utilizes a die head for each size of pipe.

Check No. 23 on Reply Card for more Details

FOR NONFERROUS METALS: Triangular prisms of strong Kennametal (90.0 Rockwell A) are copper brazed to the face of a steel backup plate, in a number of courses, to form a multiplicity of sharp, cutting edges in the new type of disk file developed by Kennametal Inc., Latrobe, Pa. It may be mounted on a grinder, abrasive disk machine, motor end or disk file machine and may be used on nonferrous metals and plastics.

Check No. 24 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

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Helpful Literature

75. Compression Load Cell

Baldwin Locomotive Works—Illustrated leaflet No. 307 describes type C compression load cells in which SR-4 resistance wire strain gages bonded to column are load sensitive elements. Cell capacities range from 2000 to 200,000 lb.

76. Pipe Orifice Meter

Layne & Bowler, Inc.—40-page illustrated pamphlet "Measurement of Water Flow Through Pipe Orifice with Free Discharge" is report on investigation made to determine relation between rate of discharge of water through number of circular orifices to pressure head causing flow. Ground water supplies, turbine pumps and assemblies are covered also.

77. Industrial Drives

W. A. Jones Foundry & Machine Co.—20-page illustrated bulletin No. 50 depicts various equipment designed for mechanical transmission of power. Listed are herringbone and worm gear speed reducers; worm-helical units for vertical shaft drives; and spur gear speed reducers. Also described are car pullers, door hoists, skip hoists, various accessories and components.

78. Plain Grinding Machines

Cincinnati Grinders Inc.—12-page illustrated publication No. G-594 explains features of Filmatic 14 and 16-in. plain grinding machines. Among these are grinding wheel spindle bearings which require no adjustment for any grinding condition, grouping of all operating controls at front of bed, and infinitely variable electronically controlled table traverse speeds.

79. Diecasting Machine

Cleveland Automatic Machine Co.—4-page illustrated bulletin describes model No. 50 universal high pressure diecasting machine that can be obtained either as gooseneck or cold chamber type. General specifications of machine as used with aluminum, brass and magnesium or with zinc, tin and lead are tabulated.

80. Spray Booths

Binks Mfg. Co.—4-page illustrated insert describes Dynaprecipitor water wash spray booths for use in conjunction with industrial finishing operations.

81. Flexible Plastic Tubing

U. S. Stoneware Co.—24-page illustrated booklet No. T-77 discusses properties and uses of standard Tygon modified vinyl plastic formulations in extruded form. Flexibility, toughness and lightness in weight, plus resistance to abrasion, wear and chemical attack, make material suitable for wide variety of applications.

82. Fire Protection Equipment

Walter Kidde & Co.—12-page illustrated circular P-8 is guide to five basic types of fire extinguishers and classes of fire for which they are suitable. Described are carbon dioxide, dry chemical, water, foam and vaporizing liquid types. Also included are data on complete fire detection and protection systems.

83. Cutting Tools

Continental Tool Works—136-page illustrated catalog 60681 lists line of standard carbide and high speed steel cutting tools, shows many special tools and contains complete broach and fixture section. Useful information and charts on metalworking are included for ready reference.

84. Truck Cranes

Michigan Power Shovel Co.—Illustrated leaflet No. 102 explains remote control method of driving truck crane from crane cab. With remote control, crane operator can hoist, swing and move crane forward or reverse, and steer right or left. It eliminates delay in moving truck crane short distances and centers all controls in hands of one operator.

85. Carburizer-Nitrider

Hevi Duty Electric Co.—28-page illustrated bulletin No. HD 646 explains construction and operation and depicts numerous installations of carburizer-nitrider. In addition to carburizing and nitriding, unit can be used for dry cyaniding, bright annealing of nonferrous materials, clean hardening of steel and clean annealing of steel and cast and malleable iron.

86. Industrial Plants

Continental Industrial Engineers, Inc.—12-page illustrated booklet No. 127 discusses facilities of company for engineering, manufacturing and construction of complete industrial plants; production lines and special automatic machines; and industrial furnaces, ovens and dryers.

87. Temperature Indicators

Claud S. Gordon Co.—6-page folding catalog No. 495 presents details on Tempilstik crayon, Tempil pellets and Tempilaq liquid temperature indicators. Available in temperature range from 113 to 1650° F. indicators have mean accuracy of plus or minus 1 per cent of stated temperature.

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88. Die Blocks, Inserts & Tools

A. Finkl & Sons Co.—16-page illustrated booklet "Mo-Lyb-Die" discusses and shows steps in production of Mo-Lyb-Die processed die blocks, inserts and tools. Four types are obtainable which are heat treated, ready to use, and commercially machinable with high speed or carbide tools. They are suitable for production of ferrous and nonferrous forgings in drop hammers, forging presses and forging machines.

89. Dieing Machines

Hartford-Empire Co., Henry & Wright Div.—40-page illustrated catalog No. 48 outlines features of dieing machines for stamping and punching operations. Machines are obtainable in capacities from 10 to 150 tons.

90. Hydraulic Tables

Baldwin Locomotive Works — 36-page illustrated bulletin No. 300 is new edition of "Hydraulic Tables" intended for designers and users of hydraulic equipment. It includes capacities of hydraulic rams, displacements of single-acting plungers, and steel pipe tables including water flow rates and friction losses of fittings. In addition it tells how to use accumulators, pumps and shock valves.

91. Industrial Wire Cloth

Reynolds Wire Co.—40-page illustrated catalog B presents information on industrial wire cloth woven from aluminum, brass, bronze, phosphor bronze, copper, Monel and stainless steel which is available in widths from 24 to 48 in. and in rolls of 100 lineal ft. Glossary of special terminology, engineering data, ordering instructions and other pertinent information are included.

92. Cast Sprockets

Chain Belt Co.—16-page illustrated bulletin No. 49-30 depicts Rex stock size cast sprockets for line of Rex drive and conveyor chains. Dimensions, specifications, rules for selection and alignment, and sprocket styles are included. Sprockets can be obtained for all sizes and styles of chain with exception of chain using cut tooth sprockets.

93. Water Pump Ball Bearings

Marlin-Rockwell Corp.—12-page illustrated booklet No. 1533 discusses ball bearings designed especially for fan and pump in automotive applications where these two units are carried on same shaft. Dimensional drawings, load ratings and interchangeability factors are given also.

94. Stock Straightener-Cutter

Mettler Machine Tool, Inc. — 2-page illustrated leaflet "Presenting a New Shuster Automatic Flat Stock Machine" describes machine that straightens and cuts flat, square or hexagon stock. Unit features 12-roll straightener and instantaneously operating clutch and cutoff cam.

95. Synchronous Generators

General Electric Co.—8-page illustrated publication GEA-5415 deals with Tri-Clad high-speed synchronous generators for standby, portable and prime source power. Ratings from 12½ to 1250 kva and speeds from 1800 to 514 rpm are covered.

96. Overhead Conveyors

Cleveland Tramrail Div., Cleveland Crane & Engineering Co.—12-page illustrated form 2006 E contains engineering and application data on line of overhead materials handling equipment. Covered are rail and arch beam, switches, cranes and transfer bridges, carriers for hand or electric operation, hoists, gantry cranes, buckets and grabs and complete Tramrail systems.

97. Socket Screw Products

Standard Pressed Steel Co. — 14-page illustrated form No. 643-R covers line of socket screw products and allied items. Included are cap and set screws, stripper bolts or shoulder screws, pressure plugs, dowel pins and hexagon keys. Full specifications and prices are given.

98. Heating Elements

Cutler-Hammer, Inc.—6-page illustrated folder HE-23 describes Pyroflex heating elements and thermostats for electric water heaters. Elements feature pressure-type wire connectors, flat Bakelite terminal blocks, Heli-Arc welded terminal plates and water-tight flange. Thermostats are clamp-on type and provide maximum safety through vapor power operation.

99. Thermal Insulations

Johns-Manville — Ready reference wall chart lists various thermal insulations according to their effective ranges. Since information is depicted graphically, it is easy to determine suitable Fahrenheit or Centigrade temperature ranges for material backed-up or backed-up and exposed. Insulation material listed includes pipe, refractory, sheets, cements, blocks, lagging and blankets.

100. Metal Degreasing

E. I. du Pont de Nemours & Co.—10-page illustrated brochure "Metal Degreasing — Standard Practices" gives details of vapor degreasing process employing chlorinated solvents. Space is devoted to design, installation and operation of degreasing machines as well as solvents, first aid treatment and literature references.

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Market Summary

TWENTY to 30 point drop in steelmaking within two weeks threatens unless coal supply improves quickly. That is the prediction of some steel authorities as the paralyzing effects of the coal strike spread. Additional blast furnaces have been banked. More stacks are on reduced wind. Coking operations are being curtailed further. Further sharp cutbacks in iron and coke production will come this week should the coal impasse continue. Steelmaking is only slightly affected so far. But ingot operations retrenchment appears certain with freight shipments slowing down due to reduced train schedules, and manufacturing operations threatened by power shortages.

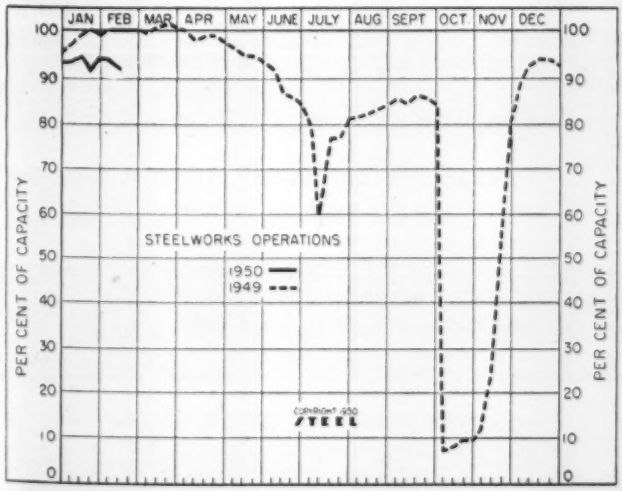
OPERATIONS—Estimated national steel ingot rate dropped 2½ points last week to 91.5 per cent of rated capacity, lowest since the first week in December. Production declined 8 points to 76 per cent in eastern Pennsylvania, 5 points to 92 in Youngstown, 4½ points to 84.5 in St. Louis, 3 points to 104 in Detroit, and 1½ points to 88.5 in the West. The rate rose 2 points to 80 in New England and ½ point to 95 and 98, respectively, at Pittsburgh and Chicago. At Cleveland operations held steady at the revised rate of 97.5 per cent. At weekend sharp curtailments were scheduled at Wheeling and Birmingham.

SUPPLY—Finished steel consumers have been little affected to date by the coal situation. With steel operations and freight schedules being reduced, however, comfortable supply conditions may worsen quickly. In some areas general manufacturing is curtailed by short power supply, the public utilities being pinched for fuel. Generally, metalworking plants are not too greatly concerned over the supply outlook as yet, except for sheets and pipe. These latter products have been in tight supply since the steel strike and any interruption in supply services would be felt by users almost immediately. Pig iron and coke consumers are more alarmed than finished steel users.

DEMAND—Not much protective buying is noted. But consumers are specifying more heavily against contracts. This is especially noticeable in flat-rolled products and pig iron. Deliveries on major sheet and strip items are far extended and the supply stringency is increasing. Bids are asked by the government for more grain storage bins. This means increased pressure for galvanized sheets already sold out for first half. Carbon bars are moving well but tonnage in the larger sizes is available in six weeks. Cold-drawn and alloy bars can be had for early shipment. Plates are sluggish in the East but more active in the Midwest and South. Some railroad work is shaping up and the oil industry is showing a little more interest. Activity is developing in structurals as spring building season nears.

PRICES—The latest movement in steel prices appears about completed. Isolated changes in mill quotations and extras continue but these are largely adjustments. Further upward revisions over coming months remain a possibility, depending on competitive conditions. Last week two southern pig iron producers raised prices $3 per ton. Machine and wood screws were increased 5 to 6 per cent. Oven coke went up $1 per ton at several points and ladle brick prices were adjusted upward. Prices on some grades of chrome ore were reduced.

COMPOSITES—STEEL's weighted index for finished steel is unchanged at 156.13. The arithmetical composite also is steady at $93. Increases in the South raised the No. 2 foundry pig iron composite to $46.47, and that on basic to $45.97. The malleable iron index held at $47.27. Stronger undertone in scrap is reflected in a rise in the steelmaking grade price composite to $27.42 from $27.33. Larger use of scrap in steelmaking is anticipated.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Feb. 11	Change	Same Week 1949	Same Week 1948
Pittsburgh	95	+ 0.5	97.5	90
Chicago	98	+ 0.5	100	92.5
Eastern Pa.	76	— 8	97	90
Youngstown	92	— 5	105	102
Wheeling	101	None*	94.5	88.5
Cleveland	97.5	None*	96	96
Buffalo	101.5	None	104	86
Birmingham	100	None	100	100
New England	80	+ 2	89	79
Cincinnati	101	None	102	85
St. Louis	84.5	— 4.5	89.5	78
Detroit	104	— 3	106	90
Western	88.5	— 1.5	..	..
Estimated national rate	91.5	— 2.5	100	93

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
*Change from revised rate.

Summary—p. 51 Production-Engineering News—p. 81

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Composite Market Averages

	Feb. 9 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.13	156.13	156.13	155.05	100.65
Index in cents per lb...	4.230	4.230	4.230	4.200	2.727
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$93.00	$93.00	$92.86	$97.77	$57.55
No. 2 Fdry Pig Iron, GT	46.47	46.22	46.22	46.63	23.67
Basic Pig Iron, GT.....	45.97	45.72	45.72	46.22	23.00
Malleable Pig Iron, GT..	47.27	47.27	47.27	47.34	24.29
Steelmaking Scrap, GT..	27.42	27.33	26.83	38.83	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Feb. 9 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35–55	2.15
Bars, H.R., Chicago.....	3.45	3.45	3.45	3.35	2.15
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95–4.25	2.65
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25–30	2.10
Shapes, Std., Chicago.....	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40–60	2.20
Plates, Chicago	3.50	3.50	3.50	3.40	2.20
Plates, Coatesville, Pa. ...	3.60	3.60	3.60	3.75	2.20
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.45	2.20
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.95	2.20
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25–30	2.20
Sheets, H.R., Chicago.....	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh...	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago.....	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.65
Strip, H.R., Pittsburgh....	3.25	3.25	3.25	3.25–70	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25–30	2.10
Strip, C.R., Pittsburgh....	4.15	4.15	4.15	4.00–75	2.80
Strip, C.R., Chicago.....	4.30	4.30	4.30	4.00–25	2.90
Strip, C.R., Detroit	4.35–40	4.35–40	4.35–40	4.20–50	2.90
Wire, Basic, Pittsburgh...	4.50	4.50	4.50	4.15–50	2.60
Nails, Wire, Pittsburgh...	5.30	5.30	5.30	5.15–6.30	2.80
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$6.70	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$40.00
Sheet bar, mill (NT)	57.00–58.00	57.00–58.00	51.78–57.00	67.00	34.00
Wire rods, 7/32-3/8", Pitts. .	3.85	3.85	3.85	3.40–4.15	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$24.50
Basic, Valley	46.00	46.00	46.00	46.00	23.50
Basic, del. Phila.	49.44	49.44	49.44	50.30	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, Chicago.....	46.50	46.50	46.50	46.00–50	24.00
No. 2 Fdry, Valley.....	46.50	46.50	46.50	46.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	50.80	25.84
No. 2 Fdry, Birm.	42.38	39.38-42.38	39.38-42.38	43.38	20.38
No. 2 Fdry. (Birm.) Del Cin.	49.08	46.08	46.08	49.43	24.06
Malleable, Valley	46.50	46.50	46.50	46.50	24.00
Malleable, Chicago	46.50	46.50	46.50	46.50	24.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	163.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$31.25	$31.25	$30.00	$41.00	$20.00
No. 1 Heavy Melt. E. Pa..	23.50	23.25	23.50	39.50	18.75
No. 1 Heavy Melt. Chicago	27.50	27.50	27.00	36.00	18.75
No. 1 Heavy Melt. Valley..	31.25	31.25	30.25	37.75	20.00
No. 1 Heavy Melt. Cleve..	28.25	28.25	27.25	37.25	19.50
No. 1 Heavy Melt. Buffalo	27.75	27.75	27.75	40.50	19.25
Rails, Rerolling, Chicago..	39.50	39.50	39.50	48.00	22.25
No. 1 Cast, Chicago.....	40.50	40.50	38.50	44.00	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl...	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.50	15.50	15.50	17.00	7.75
Oven Fdry., Chicago.....	21.00	21.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	18.50	18.50	18.50	23.50	12.00
Zinc, E. St. Louis.....	9.75	9.75	9.75–10.00	17.50	8.25
Lead, St. Louis	11.80	11.80	11.80	21.30–35	6.35
Tin, New York	74.50	74.25	77.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	17.00	15.00
Antimony, Laredo, Tex. ..	27.25	27.25	32.00	38.50	14.50
Nickel, refinery, duty paid.	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward, Ala. W15	41.88	42.38	....	....
Cincinnati, del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y., W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y. T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
IndianaHarbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14, Y1	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
LosAngeles, SanFrancisco, del.	53.70	54.20	....	....
GraniteCity, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	46.00	46.50	46.50	47.00
Pitts, N.&S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKeesRock, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y., R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O. del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson, O. G2	$57.00
Jackson, O. J1	57.50
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

LylesTenn. T3	$60.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, Intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, Feb. 9, 1950; cents per pound unless otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)

Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & Slabs Carbon, Rerolling (NT)

Bessemer,Pa. C3 .... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 .. 58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 52.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 ..... 53.00
Lackawanna,N.Y. B2 .. 53.00
Munhall,Pa. C3 ..... 53.00
Sharon,Pa. S3 ..... 57.00
So.Chicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 .. 53.00

Carbon, Forging (NT)

Bessemer,Pa. C3 .... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 .. 65.00
Detroit R7 ..... 63.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 .... 71.00
Ind.Harbor,Ind. I-2 .. 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 63.00
LosAngeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14 .. 63.00
So.Duquesne,Pa. C3 .. 63.00
So.SanFrancisco B3 .. 82.00
Warren,O. C17 ..... 63.00

Alloy (NT)

Bethlehem,Pa. B2 ... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 .... 66.00
Conshohocken,Pa. A3 .. 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 .... 74.00
Ind.Harbor,Ind. Y1 .... 66.00
Johnstown,Pa. B2 .... 66.00
Lackawanna,N.Y. B2 .. 66.00
LosAngeles B3 ..... 88.00
Massillon,O. R2 .... 66.00
Midland,Pa. C18 .... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago C3,R2,W14 .. 66.00
So.Duquesne,Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

SHEET BARS (NT)

Mansfield,O. E6 ..... $58.00
Sharon,Pa. S3 ..... 57.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I-2 ... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00

SKELP

Aliquippa,Pa. J5 ..... 3.15
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 ... 3.15

WIRE RODS

AlabamaCity,Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 .... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 ... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11 4.10
Pittsburg,Calif. C11 ... 4.50
Portsmouth,O. P12 .... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 .... 3.85
Sparrows Point B2 .... 3.95
Sterling,Ill.(1) N15 ... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 .... 4.65

STRUCTURALS
Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 .... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 ... 3.40
Johnstown,Pa. B2 .... 3.45
KansasCity,Mo. S5 .... 4.00
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 ... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 .... 4.02
Phoenixville,Pa. P4 ... 3.30
Portland,Oreg. O4 .... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3, W14 .. 3.40
So.SanFrancisco B3 ... 3.95
Torrance,Calif. C11 .... 4.00
Weirton,W.Va. W6 .... 3.40

Alloy Stand. Shapes

Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 .... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 .... 4.05

H.-S. Low-Alloy Stand. Shapes

Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 .. 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 .... 5.75
Gary,Ind. C3 ..... 5.15
Ind.Harbor,Ind. I-2, Y1 .. 5.15
Johnstown,Pa. B2 .... 5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 .... 5.15
Struthers,O. Y1 ..... 5.15

Wide Flange

Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 .... 3.40

H-S., L-A. Wide Flange

Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill., C3 .... 5.10

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 ... 4.20
Lackawanna,N.Y. B2 .. 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 .... 4.20
Weirton,W.Va. W6 .... 4.20

PLATES, Carbon Steel

AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 .. 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 .... 3.60
Conshohocken,Pa. A3 .. 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 .... 3.50
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2, Y1 .. 3.50
Johnstown,Pa. B2 .... 3.50
Lackawanna,N.Y. B2 .. 3.50
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. C3, W14 .. 3.50
SparrowsPoint,Md. B2 .. 3.50
Steubenville,O. W10 .... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, Y1 .... 3.50

PLATES (Universal Mill)

Fontana,Calif. K1 .... 4.40

PLATES, Carbon, A.R.

Fontana,Calif. K1 .... 5.25

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 .... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 .... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 .... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 .... 4.40
SparrowsPoint,Md. B2 .. 4.40

PLATES, Wrought Iron

Economy,Pa. B14 ..... 7.85

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 .. 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 .... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 .. 5.35
Johnstown,Pa. B2 .... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 .... 5.35
SparrowsPoint,Md. B2 .. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

FLOOR PLATES

Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 .. 4.55
Harrisburg,Pa. C5 .... 4.55
Ind. Harbor, Ind. I-2 .. 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 .... 4.55

PLATES, Ingot Iron

Ashland,c.l.(15) A10 .. 3.75
Ashland,lcl(15) A10 .. 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.,cl R2 ..... 4.10

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 .. 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Ashland,Ky.(17) A10 .. 3.45
Atlanta,Ga. A11 ..... 3.60
Bessemer,Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 .... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1 .. 3.45
Johnstown,Pa. B2 .... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Marion,O. P11 ..... 3.35
Midland,Pa. C18 ..... 3.45
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 ... 3.85
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11 .. 3.45
Pittsburg,Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 .... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14 .. 3.45
So.Duquesne,Pa. C3 ... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2 .... 3.45

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 .... 3.45
Lackawanna,N.Y. B2 .. 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 .... 3.45
Portland,Oreg. O4 .... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 .... 3.45

BAR SIZE ANGLES; H.R.CARBON

Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1 .. 3.95
Johnstown,Pa. B2 .... 3.95
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14 .. 3.95
So.Duquesne,Pa. C3 ... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 .... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 .... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1 .. 5.20
Johnstown,Pa. B2 .... 5.20
Lackawanna,N.Y. B2 .. 5.20
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 ... 5.20
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 .... 4.15
BeaverFalls,Pa. M12,R2 .. 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.63
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 .... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.35
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 .. 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13 .. 4.15
Hartford,Conn. R2 .... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8 ... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 .... 4.15
SpringCity,Pa.(5) K3 .. 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 .... 4.15

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 .... 4.90
BeaverFalls,Pa. M12 .. 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13 .. 4.90
Hartford,Conn. R2 ..... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 .. 4.90
Mansfield,Mass. B5 .... 5.20
Massillon,O. R2, R8 ... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 .... 5.10
So.Chicago,Ill. R2, W14 .. 4.90
Struthers,O. Y1 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Warren,O. C17 ..... 4.90
Worcester,Mass. A7 .... 5.20
Youngstown F3, Y1 .... 4.90

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 .. 3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta,Ga. A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 .... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 .... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1 .. 3.45
Johnstown,Pa. B2 .... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Minnequa,Colo. C10 ... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburg,Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 .... 4.20
SandSprings,Okla. S5 .. 4.35
Seattle,Wash. B3, N14 .. 4.20
So.Chicago,Ill. R2 .... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 .... 4.20
SparrowsPoint,Md. B2 .. 3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Youngstown C3, R2 .... 3.45

BARS, Reinforcing (Fabricated; to Consumers)

Huntington,W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 .. 4.35
LosAngeles B3 ..... 5.00
Marion,O. P11 ..... 4.25
Pittsburgh J5 ..... 4.35
Seattle B3, N14 ..... 5.10
So.SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 .. 4.35
Williamsport,Pa. S19 .. 4.35

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2 .. 3.30
ChicagoHts.,Ill.(4) I-2 .. 3.45
FortWorth,Tex.(26) T4 .. 4.33
Hntngtn,W.Va.(3) W7 .. 3.45
Moline,Ill.(3) R2 ..... 3.35
Williamsport(2,3) S19 .. 3.45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 .. 9.50
Economy,Pa.(D.R.)B14 11.00
Economy(Stablt) B14 .. 11.30
McK.Rks.(S.R.) L5 .... 8.60
McK.Rks.(D.R.) L5 .. 11.25
McK.Rks.(Staybolt) L5 .. 12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky. A10 ..... 3.70

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 .. 3.35
Ashland,Ky.(8) A10 .. 3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 .. 3.45
Ecorse,Mich.(8) G5 .... 3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 .... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1 .. 3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. N12 ..... 3.50
Niles,O. M4 ..... 3.75
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.35
So.Chicago,Ill. W14 .... 3.35
SparrowsPoint,Md. B2 .. 3.35
Steubenville,O. W10 .... 3.35
Torrance,Calif. C11 .... 4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 .. 4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Niles,O. M4 ..... 4.65
Torrance,Calif. C11 .... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 .. 5.05
Ecorse,Mich. G5 ..... 5.25
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 .... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1 .. 5.05
Irvin,Pa. C3 ..... 5.05
Lackawanna,N.Y. B2 .. 5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C3 .... 5.05
SparrowsPoint,Md. B2 .. 5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 .... 5.05
Youngstown C3, Y1 .... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 .... 7.10
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1 .. 6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna,N.Y. B2 .. 6.20
Pittsburgh J5 ..... 6.20
Sharon,Pa. S3 ..... 6.20
SparrowsPoint,Md. B2 .. 6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	4.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Gavannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Well Casing

Torrance,Calif. C11	4.85
Youngstown C3	3.85

SHEETS, Drum Body

Pittsburg,Calif. C11	3.95
Torrance,Calif. C11	3.95

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBotm, W.V. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.60
Gary,Ind. C3	6.50
Ind.Harbor I-2	6.50
Irvin,Pa. C3	6.50
Yorkville,O. W10	6.50

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Yorkville,O. W10	8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Culvert, No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T-2	5.20	5.45
Gary C3	5.20	5.45
GraniteCity G4	5.40	5.70
IndianaHarbor I-2	5.20	5.45
Irvin C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt, B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R-2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R. (22 Ga.) Coils (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	6.95	7.45	8.45	9.25
Brackenridge,Pa. A4	...	...	7.45	8.45	9.25
Follansbee F4 (cut lengths)	...	...	6.95	7.95	8.75
GraniteCity,Ill. G4	...	...	7.65	8.65	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Vandergrift,Pa. C3	...	6.95	7.45	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (24 Ga. Base)

Mansfield,O. E6	5.90	6.20	6.70	7.95	8.75
Niles,O. M4	5.65	5.95	6.45	...	...
Niles,O. N12	...	6.45	6.95	...	...

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. W10	9.80	10.35	11.05	11.85
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Follansbee F4 (cut lengths)	9.30	9.85	10.55	11.35
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80
Vandergrift,Pa. C3	12.35	13.60	14.85

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2.	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4.	7.50	7.70
Ind.Harb. 1-1, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1.	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2.	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15.	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15.	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15.	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Conshohocken,Pa. A3	3.35
Detroit M1	3.55
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1.	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11.	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	3.90
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15.	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn,Conn.(10) S15.	9.50
Pawtucket,R.I.(11) N8.	9.50
Pawtucket,R.I.(12) N8.	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	...
NewCastle,Pa. E5	4.15	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8: Cleve.orPitts.Base (29)	4.55	5.50	6.10	8.05	10.35
Worcester,Base (29)	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.15	5.95	6.55	8.50	10.80
Trenton,N.J. R5		*6.25*	*6.85*	*8.80*	*11.10*
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.50	5.50	6.10	8.05	10.35
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.35	11.30	13.90

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15.	4.15
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.40
Detroit, D2	4.40
Detroit M1	4.35
Dover,O. G6	4.15
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.15
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.65
Middletown,O. A10	4.15
NewBritain(10) S15	4.15
NewCastle,Pa. B4, E5.	4.15
NewHaven,Conn. A7, D2.	4.65
NewYork W3	5.00
Pawtucket,R.I.(11) N8.	4.70
Pawtucket,R.I.(21) N8.	4.65
Riverdale,Ill. A1	4.30
Sharon,Pa.(30) S3	4.15
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	4.65
Wallingford,Conn. W2	4.65
Warren,O.(25) T5	4.15
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	American Steel& Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Tube
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Bolardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B14	A. M. Byers Co.
C1	Calif. Cold-Rolled Steel
C3	Carnegie-Illinois Steel
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Clev. Cld.Roll.MillsCo.
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Co.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F6	Fretz-Moen Tube Co.
G1	Geneva Steel Co.
G2	Globe Iron Co.
G3	Globe Steel Tubes Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H4	Heppenstall Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K5	Kidd Drawn Steel Co.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

UNIVERSITY OF MICHIGAN LIBRARIES

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass.(12) N6	6.20
Monessen,Pa. P7	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85
Worcester J4, T6, W12	6.20

WIRE, Cold-Rolled Flat

Buffalo W12	5.35
Cleveland A7	5.35
Dover,O. G6	5.15
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7	5.35
Pawtucket,R.I.(11) N8	5.70
Pawtucket,R.I.(12) N8	5.65
Trenton,N.J. R5	5.65
Worcester,Mass. A7, W12	5.65
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.05
Crawfrdsvil,Ind. M8	8.60
Fostoria,O. S1	8.45
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.05
Worcester,Mass. T6	8.75
Worcester,Mass. A7	8.35

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland C20	4.15
Cleveland A7	4.50
Crawfrdsvil,Ind. M8	4.65
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark,6-Sga. I-1	5.15
No.Tonawanda B11	4.90
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. T6	4.45
Worcester,Mass. A7	4.80

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen P7	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.05	8.05	8.30
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.25	5.70
Bartnville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfrdvil. M8	5.50	5.75
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy,Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.10	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.55	5.60
Torrance,Cal. C11	6.10	...
Worcester A7	5.65	5.90

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdsvil M8	9.95	11.45
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	9.40	10.90
Palmer,Mass. W12	9.35	10.85
Pitts.,Cal. C11	9.75	11.25
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Galv'd ASCR Core

Roebling,N.J. R5	8.45

WIRE, Tire Bead

Roebling,N.J. R5	10.80

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill.(19) K4	126
Crawfordsville M8	129
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
Duluth A7	112
Huntington,W.Va. W7	116
Johnstown,Pa. B2	112
Joliet,Ill. A7	121
Minnequa,Colo. C10	121
Moline,Ill. R2	116
Williamspt,Pa. S19	120

WOVEN FENCE, 9-15½ Ga. Col.

Ala.City,Ala.,17-18ga.R2	198
AlabamaCity,Ala. R2	116
Aliquip.,Pa.9-14½ga. J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsvil,Ind. M8	119
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Jonnstown,Pa. B2	116
Johnstn.17ga.,6" B2	190
Johnstn.17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill.(1) N15	116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	116
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	113
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Steling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7)

	Col.
AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	112
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfrdsvil,Ind. M8	5.50
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.65
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	8.50
KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.60
Pittsburgh,Pa. O3, P14	9.10
Seattle B3	9.35

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I-2, Y1	5.35
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...

Key to Producing Companies

M1	McLouth Steel Corp.	P12	Portsmouth Steel Corp.
M4	Mahoning Valley Steel	P13	Precision Drawn Steel
M5	Medart Co.	P14	Pitts. Screw & Bolt Co.
M6	Mercer Tube & Mfg. Co.	P15	Pittsburgh Metallurgical
M8	Mid-States Steel & Wire	P16	Page Steel & Wire Div., Amer. Chain & Cable
M9	Midvale Co.	P17	Plymouth Steel Co.
M10	Missouri-Illinois Furnace	R1	Reeves Steel & Mfg. Co.
M12	Moltrup Steel Products	R2	Republic Steel Corp.
M13	Monarch Steel Co.	R3	Rhode Island Steel Corp.
M14	McInnes Steel Co.	R5	Roebling's Sons, John A.
N2	National Supply Co.	R7	Rotary Electric Steel Co.
N3	National Tube Co.	R8	Reliance Div.,Eaton Mfg.
N5	Nelsen Steel & Wire Co.		
N6	New EngHighCarb Wire		
N8	Newman-Crosby Steel	S1	Seneca Wire & Mfg. Co.
N12	Niles Rolling Mill Co.	S3	Sharon Steel Corp.
N14	Nrthwst. Steel Roll.Mills	S5	Sheffield Steel Corp.
N15	Northwestern S.&W. Co.	S6	Shenango Furnace Co.
N16	New Dolphos Mfg. Co.	S7	Simmons Co.
O3	Oliver Iron & Steel Corp.	S8	Simonds Saw & Steel Co.
O4	Oregon Steel Mills.	S9	Sloss-Sheffield S.&I. Co.
P1	Pacific States Steel Corp.	S13	Standard Forgings Corp.
P2	Pacific Tube Co.	S14	Standard Tube Co.
P4	Phoenix Iron & Steel Co.	S15	Stanley Works
P5	Pilgrim Drawn Steel	S16	Struthers Iron & Steel
P6	Pittsburgh Coke & Chem.	S17	Superior Drawn Steel Co.
P7	Pittsburgh Steel Co.	S18	Superior Steel Corp.
P9	Pittsburgh Tube Co.	S19	Sweet's Steel Co.
P11	Pollak Steel Co.	T2	Tenn. Coal, Iron & R.R.
		T3	Tenn. Prod. & Chem.
		T4	Texas Steel Co.
		T5	Thomas Steel Co
		T6	Thompson Wire Co.
		T7	Timken Roller Bearing
		T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
		U4	Universal Cyclops Steel
		V2	Vanadium Alloys Steel
		V3	Vulcan Crucible Steel Co.
		W1	Wallace Barnes Co.
		W2	Wallingford Steel Co.
		W3	Washburn Wire Co.
		W4	Washington Steel Corp.
		W6	Weirton Steel Corp.
		W7	W. Va. Steel & Mfg. Co.
		W8	Wstrn.Auto.Mach.Screw
		W9	Wheatland Tube Co.
		W10	Wheeling Steel Corp.
		W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
		W13	Wilson Steel & Wire Co.
		W14	Wisconsin Steel Div., International Harvester
		W15	Woodward Iron Co.
		W16	Worth Steel Co.
		W18	Wyckoff Steel Co.
		Y1	Youngstwn Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	124.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	149.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles. (3) Merchant. (4) Reinforcing. (5) Philadelphia del. (6) Chicago or Birm. Base. (7) To jobbers, 3 cols. lower. (8) 16 gage and heavier. (9) 6 in. and narrower. (10) Pittsburgh Base. (11) Cleveland & Pittsburgh Base. (12) Worcester, Mass. Base. (13) 3" & wider; over ½" to under 2" 5.15c. (14) Also wide flange beams. (15) ½" and thinner. (16) 40 lb and under. (17) Flats only. (18) To dealers. (19) Chicago & Pittsburgh Base. (20) Deduct 0.25c for untreated. (21) New Haven, Conn. Base. (22) Del. San Fran. Bay area. (23) Angles 1"x1" to 1¼"x1¼" only. (24) Deduct 0.35c for finer than 15 Ga. (25) Up to 0.035 C; 4.40c, 0.035 C and over. (26) Reinforcing, mill shipments; to consumers, 4.85c; fabricated to fabricators, 4.55c. (27) 22 Gage; hot or cold-reduced. (28) Bonderized. (29) 0.26-0.40 C. (30) 0.40 C and less. (31) Not annealed. (32) Untreated. (33) To jobbers, deduct 20 cents. (34) 6.70c for cut lengths.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	...	8.5	9	...
¼	6.0	0.42	33.5	31.5	...	9.5	11	...
⅜	6.0	0.57	29	27	...	5.5	8	...
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.0	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10. Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	6.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	—Elec. Weld— H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	Carbon Base 20%	—Strip— Cold-Rolled Carbon Base 10%	Both sides	—Sheets— Carbon Base 10%	Carbon Base 20%	Copper Base Both Sides
302 ...	....	....	....	....	19.75	21.50–22.50	75.00
304 ...	22.50	26.50	....	....	20.75	22.50–24.00	77.00
305 ...	....	....	....	....	....	....	79.00
309 ...	27.00	31.00	....	....	....	....	....
310 ...	32.50	36.50	....	....	....	....	105.00
316 ...	27.00	31.00	....	....	26.00	28.00–32.00	....
317 ...	30.50	34.50	....	....	....	....	....
318 ...	29.50	33.50	....	....	....	....	....
321 ...	23.50	27.50	....	....	23.00	25.00	90.00
347 ...	25.00	29.00	....	....	24.00	26.00–30.00	94.00
405 ...	18.75	24.75	....	....	....	....	....
410 ...	18.25	24.25	....	....	....	....	....
430 ...	18.25	24.25	....	....	....	....	....
Nickel.	27.50	34.50	31.50	41.00	....	....	88.00
Inconel.	36.00	46.00	....	....	....	....	115.00
Monel .	29.00	37.00	26.50	33.50	....	....	83.00
Copper*	....	....	19.75†	23.75†	....	....	....

* Deoxidized. † Deduct 4.25c for hot-rolled. Production joints for carbon base products: Stainless plates and sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville, Pa. L7; nickel, inconel and monel-clad plates, Coatesville L7; nickel, monel and copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	27
⅝-in. & ⅝-in.	29
¾-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up Bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	Reg.	Heavy
½-in. and smaller	25	
⅝-in. & ⅝-in.	23	
¾-in.-1½-in.	23	
1⅝ in. and larger	16	
H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅝-in.	28	25
¾-in.-1½-in.	25	23
1⅝ in. & larger	17	16
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅝-in.	30	27
¾-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

½-in. and smaller	Hvy.	Reg.	Lght.
⅝-in. & ⅝-in.	30	36	36
¾-in.-1½ in.	27	31	33
1⅝-in. & larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	63.5 & 10
Plated finishes	50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.:	
¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.25c
⅞-in., under	43 off

Washers, Wrought

F.o.b. shipping point, to jobbers ..... Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00
CARBON		
40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2.

Baltimore, bars, wire and structurals A10.

Brackenridge, Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.

Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.

Detroit, strip, except Type 309 M1.

Dunkirk, N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501, 10.50c, Type 502 11.50c R2.

McKeesport, Pa., bars; sheets except Type 416, C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4.

So. Chicago, Ind., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18

Titusville, Pa., bars U4.

Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.

Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	22.00
Toluol, one deg.	19.00-24.75
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do. tank cars	12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-$40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh)

	Cents
Sponge Iron:	
98+% Fe, carlots	15.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed, 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	65.00-130.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500-lb drums, freight allowed	30.00
Brass, 10-ton lots	23.25-26.25
Copper:	
Electrolytic	27.75
Reduced	27.00
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel, unannealed	61.00-66.00
Silicon	34.00-40.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	86.50
Zinc, 10-ton lots	15.25-18.00
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8%, minus 65 mesh, freight allowed, 1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll. fur.	$13.00-13.50
Connellsvll, fdry.	15.00-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60

OVEN FOUNDRY COKE

Kearny, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.‡	22.70
Chicago, ovens	21.00
Chicago, del.	22.45
Detroit, del.	24.01
Terre Haute, ovens	21.28
Milwaukee, ovens	21.75
Indianapolis, ovens	19.85
Chicago, del.	23.32
Cincinnati, del.	22.77
Detroit, del.	23.75
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	21.90
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	17.50
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

UNIVERSITY OF MICHIGAN LIBRARIES

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.75	6.84	7.20	6.04	...	5.85	6.64	8.60	5.65	5.90	7.34
New York(c'try)	5.55	6.54	6.90	5.84	...	5.65	6.44	8.40	5.45	5.70	7.14
Boston (city) ..	5.75	6.68	7.19	5.98	...	5.80	6.50	8.70	5.75	6.08	7.28
Boston (c'try) .	5.55	6.48	6.99	5.78	...	5.60	6.30	8.50	5.55	5.88	7.08
Phila. (city) ..	6.45	6.60	6.95	5.90	...	5.75	6.46	8.40	5.50	5.70	6.80
Phila. (c'try) .	6.20	6.35	6.70	5.65	...	5.50	6.21	8.15	5.25	5.45	6.55
Balt. (city) ...	5.25	6.69	6.66	5.79	...	5.69	6.39	...	5.69	5.40	7.04
Balt. (c'try) ..	5.05	6.49	6.46	5.59	...	5.49	6.19	...	5.49	5.20	6.84
Norfolk, Va. ..	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse).	6.07‡	...	...	6.00	...	5.90	6.62	...	5.90	6.10	7.47
Buffalo (del.)..	5.20	5.95	6.94	5.56	...	5.20	5.85	10.43††[8]	5.30	5.60	6.90
Buffalo (w'hse)	5.05	5.80	6.79	5.41	...	5.05	5.65	9.90††[8]	5.15	5.45	6.75
Pitts. (w'hse)..	5.05	5.80*	6.45-6.70	5.20	6.15	5.00	5.75	9.55††	5.05	5.15	6.40
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	6.03	9.86††[8]	5.44	5.59	6.68
Cleveland (del.)	5.25	6.00	7.15	5.44	6.20	5.32	5.95	8.31	5.37	5.52	6.87
Cleve. (w'hse).	5.05	5.80	6.95	5.24	6.00	5.12	5.75	8.16	5.17	5.32	6.67
Cincin. (w'hse).	5.32	5.84	6.29	5.49	...	5.39	6.10	9.90††[8]	5.44	5.59	6.75
Chicago (city)..	5.25	6.00*	6.90	5.30	...	5.20	5.85	9.75††[8]	5.25	5.40	6.60
Chicago (w'hse)	5.05	5.80*	6.70	5.10	...	5.00	5.65	9.55††[8]	5.05	5.20	6.40
Milwaukee(city)	5.39	6.14*	7.04	5.44	...	5.34	6.09	9.89††[8]	5.39	5.54	6.74
Milwau. (c'try).	5.19	5.94*	6.84	5.24	...	5.14	5.89	9.69††[8]	5.19	5.34	6.54
St. Louis(del.).	5.53	6.28	7.18	5.58	...	5.48	6.23	10.03††[8]	5.53	5.68	6.88
St. L. (w'hse).	5.38	6.13	7.03	5.43	...	5.33	6.08	9.88††[8]	5.38	5.53	6.73
Birm'ham (del.)	5.20[10]	5.95	6.30[3]	5.25[10]	...	5.15[10]	6.88	...	5.20[10]	5.35[10]	7.63[10]
Birm'hm(w'hse)	5.05[10]	5.80	6.15[3]	5.10[10]	...	5.00[10]	...	...	5.05[10]	5.20[10]	...
Omaha, Nebr...	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.95	7.15	7.60	6.00	8.25	5.95	7.70	...	5.85	5.95	8.15
L. A. (w'hse)..	5.80	7.00	7.45	5.85	8.10	5.80	7.55	...	5.70	5.80	8.00
San Francisco..	6.25[9]	8.60[2]	7.50[3]	6.75[9]	8.25[3]	6.15[9]	7.80[8]	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.70†‡	8.15[3]	...	6.90	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]
Kans. (w'hse)..	5.65	6.40	7.30	5.70	...	5.60	6.35	10.10	5.65	5.80	7.00

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; †† as annealed. Base quantities: 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; [1]—1500 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—300 to 499 lb; [9]—400 to 3999 lb; [10]—500 to 9999 lb inc.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $107; Ottawa, Ill., $106. Hard-fired, $141 and $135, respectively at various points.

High-heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., $60; New Cumberland, W. Va., $55.

Wire Cut: Chester, W. Va., Wellsville, O., $58; New Cumberland, W. Va., $53.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-$31; single paper bags, $35-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Future increases in upper lake rail freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hemitites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-$22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid. 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	18.00-18.50
48% no ratio	26.00-27.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	28.00-29.00
48% 3:1 lump	36.00-37.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75%C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 150)

Coal Strike Reducing Metals Use

Brass mills and other large consuming groups show increasing concern over future operations. Actual bookings of copper, lead and zinc hold steady. Tin prices turn upward

New York — Effects of the coal shortage threaten to reverse the favorable trend in nonferrous metal business. Rate of production, shipments and consumption of major metals, high since beginning of the year, will decline as part of the general slowdown in industrial activity until the normal flow of coal is resumed.

The coal crisis so far has been a restraining influence, but has not entirely dampened enthusiasm in major metal markets. In the face of prospects for a reduction in tin plate production, tin prices on the open market advanced last week to the level quoted by the Reconstruction Finance Corp.

On every other occasion since the "free" market was restored last September, RFC had been forced to lower its quotation to the open market level.

Buying continued active in copper, moderate in lead, and fair in zinc. It is generally agreed that substantially larger business would have been booked in the latter market last week had it not been for the coal strike.

With railroads' stocks of coal reduced to an estimated all-time low, transportation of raw materials and finished products is being curtailed. Confiscation of coal in transit by the railroads, to maintain essential service, has started. Only temporary relief can be obtained, however, by this stop-gap measure.

Some power companies have issued rationing orders, limiting use of electrictiy for industrial purposes. This is affecting the operations of plants, including refineries and smelteries, and is expected to force a shutdown of some works. Among those deeply concerned are the brass mills in New England which must continue to receive zinc to maintain operations. Their concern extends also to the widespread curtailment of production at Midwestern metalworking plants and to the possibility of shutdown of some of them.

Galvanizing Operations Cut—Some galvanizing plants are running at reduced rates due to coal shortage. In addition to a reduction in the amount of zinc used by this industry, it has created a shortage in supplies of zinc dross. Sales are being made as high as 8.00c a pound, compared with a price range of 7.25c to 7.50c applying to shipments in fulfillment of annual contracts. Due to the shortage of zinc dross, some zinc dust is being produced from slab zinc for sale at prices ranging up to 15.25c, delivered. This is 5½ cents a pound over prime western zinc and 2½ cents a pound above the regular zinc dust market.

With the coal shortage seriously affecting the automotive industry, and to a lesser extent construction, consumption of metals in two extremely important fields is being reduced. Heavy demand for copper and lead has originated largely in the needs of this two industries.

Unusually good midwinter weather in many sections of the country permitted work to proceed this year on a large number of building projects placed under construction last fall. Total value of new construction put in place in January, estimated at $1.5 billion, was 16 per cent above total for January, 1949, and set a new high for that month. This is revealed in a joint report issued by the Commerce and Labor Departments, Washington.

Copper—While primary producers are limiting sales to February and March delivery, substantial tonnages are being offered by custom smelters for delivery through May. Bookings for delivery this month already exceed 80,000 tons, indicating that the final showing for the month will compare favorably with those for December and January. Deliveries last month are estimated at over 118,000 tons. Although the display of price strength has disappeared, the market is still described as steady on the basis of 18.50c, delivered Connecticut, for electrolytic.

Lead—Custom smelters easily balanced their intake of ore and concentrates with sales last week, lending a steady price tone to the market. Receipts of lead in ore and scrap by smelters totaled 571,630 tons in 1949, an increase of about 65,000 tons from the preceding year and the largest tonnage reported since 1942 when receipts totaled 604,368 tons, reports the American Bureau of Metal Statistics. Of the 1949 total, 420,122 tons were receipts of lead in domestic ore and 58,447 tons in scrap. Receipts of lead in ore and scrap dropped to 43,622 tons in December from 48,314 tons in November and were about 21,000 tons less than the total reported for December, 1948.

Shipments of refined lead to domestic consumers during 1949 totaled 372,534 tons, a drop of 150,465 tons from 1948. Shipments in December dropped to 23,486 tons from 37,779 tons in November. Production of refined lead in 1949 totaled 558,290 tons, an increase of about 13,000 tons from the preceding year. Stocks of lead at refineries at the close of 1949 totaled 71,412 tons, an increase of about 5450 tons from the Nov. 30 total. Production of antimonial lead last year amounted to 47,959 tons compared with 115,970 tons in 1948.

Zinc—No pickup in zinc buying is expected by sellers until after the crisis in the coal industry is eliminated. Only routine business was booked last week on the basis of 9.75c, East St. Louis for prime western.

Tin—Tin market displayed signs of stabilization last week for the first time in five months. After dropping steadily from $1.03 on Sept. 27 to a low of 74.25c on Feb. 1, the market turned upward to 74.37½c on Feb. 2 and finally to 74.50c. Traders are now conjecturing on the future price policy of Reconstruction Finance Corp. which will have a decisive effect on the trend of prices on the open market.

Scovill Opens Products Depot

Chicago—Scovill Mfg. Co., Waterbury, Conn., is now operating its new brass mill products depot here. The depot, containing expanded sales office facilities at 4105 West Chicago Ave., is operated by both the Mill Products Division and Manufacturing Division personnel. It is equipped with the most up-to-date materials handling facilities and is laid out for "straight-line-flow" of materials from incoming rail shipments to outgoing deliveries.

Copper Tariff Fight Looms

Washington — Western congressmen are preparing to vigorously oppose continuation of duty-free importation of copper. They claim domestic producers are facing stiff competition from imports. A bill was introduced by Rep. James Patterson (Rep., Conn) providing for continued suspension of the import tax on copper for two years. The present Patterson Act expires June 30.

Proponents of the bill claim increasing demands for copper by fabricators, and need for stockpiling purposes makes further extension necessary. They say the problem facing domestic producers is one of production through submarginal operations rather than competition from imports. An insufficient amount of copper ore is mined domestically to adequately supply the American market, they claim. It is also said the reimposition of import taxes would necessitate an increase in costs of producing copper products.

This procedure would be of no benefit to American producers, and would instead impose a price burden on consumers of copper products, Representative Patterson says.

A bill is before the Senate which would remove the suspension and restore the import duty of two cents a pound on copper (ore, matte, bars, ingots, pigs, regulus, plates, clippings from new copper, scrap, and composition with copper chief value, on copper contained). It failed to pass the Senate by unanimous consent on several occasions in the last session.

Copper Refinery Strikes End

New York—Workers at Phelps Dodge Refining Corp.'s Laurel Hill, Long Island, refinery returned to their jobs Feb. 6, ending two-weeks strike. The new contract with International Union of Mine Mill & Smelter Workers-CIO provides for a 5-cent an hour wage increase, retroactive to Jan. 1, 1950, and will remain in effect until June 30, 1951. The company announced that similar settlement has been reached with the union at its El Paso, Tex., refinery and that an agreement had been reached previously at its mining properties in Arizona.

UNIVERSITY OF MICHIGAN LIBRARIES

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 18.50c, Conn. Valley, Lake, 18.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 16.75-18.25c; 88-10-2 (No. 215) 25.25c; 80-10-10 (No. 305) 21.75c; No. 1 yellow (No. 405) 14.25-16.00c.

Zinc: Prime western 9.75c, brass special 10.00c, intermediate 10.25c, East St. Louis; high grade 10.85c, delivered.

Lead: Common, 11.80c; chemical, 11.90c; corroding, 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-16.75c; No. 12 foundry alloy (No. 2 grade) 16.00-16.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.75-18.00c; grade 2, 17.25-17.50c; grade 3, 15.75-16.00c; grade 4, 15.25-15.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt del., 74.50c; February del. 74.25c; March del. 74.12½c; April del. 74.00c; May del. 73.87½c. Chinese, 99% tin, prompt del., nominal.

RFC selling prices for prompt delivery, ex-dock New York or f.o.b. Texas City, Tex.: Grade A, 99.8% or higher (including Straits) 74.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 27.25c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 27.75c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese, 24.00c; English, Belgium, prompt, 25.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $71-$74 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per oz.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 18.50-cent copper.)

Sheet: Copper 32.18; yellow brass 28.69; commercial bronze, 95%, 32.10; 90%, 31.61; red brass, 85%, 30.60; 80%, 30.12; best quality, 29.58; nickel silver, 18%, 42.27; phosphor-bronze, grade A, 5% 50.90.

Rods: Copper, hot-rolled 28.03; cold-drawn 29.28; yellow brass free cutting, 23.19; commercial bronze, 95% 31.79; 90% 31.30; red brass 85% 30.29; 80% 29.81.

Seamless Tubing: Copper 32.22; yellow brass 31.70; commercial bronze 90% 34.27; red brass 85% 33.51; 80% 33.03.

Wire: Yellow brass 28.98; commercial bronze, 95% 32.39; 90% 31.90; red brass, 85% 30.89; 80% 30.41; best quality brass 29.87.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.55, l.c.l. 23.17, c.l. 22.67; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.85, l.c.l. 25.60, c.l. 25.10; magnet, delivered, c.l. 28.50, 15,000 lb or more 28.75, l.c.l. 29.25.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-24	36.8	33.4	39.5
0.008-0.0075	12-24	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	36.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List price plus 45%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled, 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. 7-9	18.50	11.80	9.75	74.50	17.00	27.25	40.00	73.25
Feb. 2-6	18.50	11.80	9.75	74.375	17.00	27.25	40.00	73.25
Feb. 1	18.50	11.80	9.75	74.25	17.00	28.75	40.00	73.25
Jan. Avg.	18.50	11.80	9.81	76.02	17.00	29.92	40.00	73.25
Jan. 30-31	18.50	11.80	9.75	74.25	17.00	28.75	40.00	73.25
Jan. 25-28	18.50	11.80	9.75	75.00	17.00	28.75	40.00	73.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 28.84cc; oval 28.34c; cast 26.87c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.75c; over 250 lb, 24.75c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbls, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 91.00c, 500 to 999 lb, 91.5c; 200 to 499 lb, 92.00c; less than 200 lb, 93.5c; ball, 1000 lb and over, 93.25c; 500 to 999 lb, 93.75c; 200 to 499 lb 94.25c; less than 200 lb, 95.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 58.2c; 100 or 300 lb drums only, 100 to 500 lb, 49.9c; 600 to 1900 lb, 47.6c; 2000 to 9900 lb, 45.8c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 38.00c, f.o.b. Niagara Falls, N. Y.; 40.50c, f.o.b. Cleveland; 39.25c, del., Detroit and Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 84.50c; more than 2000 lb, 82.50c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 70.80c; 100 lb kegs 71.80c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	15.50	15.50	14.75
Yellow brass	12.50	12.25	11.37½
Commercial Bronze			
95%	14.50	14.25	13.75
90%	14.25	14.00	13.50
Red brass			
85%	14.00	13.75	13.25
80%	13.62½	13.37½	12.87½
Best Quality (71-80%)	13.37½	13.12½	12.62½
Muntz Metal	11.50	11.25	10.75
Nickel, silver, 10%	14.50	14.25	7.25
Phos. bronze, A	16.75	16.50	15.50
Naval brass	12.00	11.75	11.25
Manganese bronze	12.00	11.75	11.12½

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 15.50; No. 2 copper 14.50; light copper 13.50; composition red brass 12.75; radiators 10.25; heavy yellow brass 9.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 15.50; No. 2 copper 14.50; light copper 13.50; refinery brass (60% copper) per dry copper content 13.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 13.50-13.75, No. 2 12.50-12.75; light copper 11.50-11.75; No. 1 composition red brass 11.00-11.25; No. 1 composition turnings 10.25-10.50; mixed brass turnings 6.25-6.50; new brass clippings 10.50-11.00; No. 1 brass rod turnings 9.25-9.50; light brass 6.00-6.25; heavy yellow brass 7.25-7.50; new brass rod ends 9.75-10.00, auto radiators, unsweated 8.50-8.75; cocks and faucets, 8.50-8.75; brass pipe 9.00-9.25.

Lead: Heavy 9.25-9.50, battery plates 4.50; linotype and stereotype 10.00-10.25; electrotype 9.00-9.25; mixed babbitt 9.25-9.50.

Zinc: Old zinc 4.25-4.75; new die cast scrap 4.00-4.50; old die cast scrap 3.00-3.25.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00, No. 1 babbitt 30.00-31.00.

Aluminum: Clippings 2S 10.50-11.00; old sheets 7.50-8.00, crankcase 7.50-8.00, borings and turnings 3.00-3.50.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Feb. 9, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Feb. 9	$27.42
Feb. 2	27.33
Jan. 1950	26.93
Feb. 1949	38.48
Feb. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$31.00-31.50
No. 2 Heavy Melt.	27.00-28.00*
No. 1 Busheling	31.00-31.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	24.00-25.00*
No. 3 Bundles	23.00-24.00*
Heavy Turnings	26.00-27.00
Machine Shop Turnings	21.50-22.00†
Mixed Borings, Turnings	21.50-22.00†
Short Shovel Turnings	25.00-26.00
Cast Iron Borings	24.00-25.00
Low Phos. Steel	32.00-33.00*

Cast Iron Grades*

No. 1 Cupola Cast	*34.00-35.00*
No. 1 Machinery Cast	38.00-39.00
Charging Box Cast	31.00-32.00
Heavy Breakable Cast	*29.00-30.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*32.50-33.00*
Axles	35.00-36.00
Rails, Random Lengths	35.50-36.00
Rails, 2 ft. and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	34.00-35.00
Angles, Splice Bars	32.00-33.50*

* Nominal.
†Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$28.00-28.50
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Busheling	28.00-28.50
No. 1 Bundles	28.00-28.50
No. 2 Bundles	22.00-22.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	21.00-21.50
Short Shovel Turnings	21.00-21.50
Cast Iron Borings	21.00-21.50
Low Phos.	29.00-29.50
Cut Structurals	31.00-31.50

Cast Iron Grades

No. 1 Cupola	40.00-40.50
Charging Box Cast	36.50-37.50
Stove Plate	35.50-36.50
Heavy Breakable Cast	31.00-31.50
Unstripped Motor Blocks	31.00-32.00
Brake Shoes	28.50-29.50
Clean Auto Cast	41.00-41.50
No. 1 Wheels	35.50-36.00
Burnt Cast	31.50-32.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	*32.50-33.00*
R.R. Malleable	38.50-39.00
Rails, 3 ft and under	41.00-42.00
Rails, 18 in. and under	43.00-44.00
Rails, Random Lengths	38.00-39.00
Cast Steel	34.00-35.00
Railroad Specialties	35.00-35.50
Uncut Tires	36.00-37.00
Angles, Splice Bars	39.50-40.50

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Bundles	31.00-31.50
No. 2 Bundles	24.50-25.50
Machine Shop Turnings	21.50-22.50
Short Shovel Turnings	23.50-24.00
Cast Iron Borings	23.50-24.00
Low Phos.	32.50-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*33.00-33.50*

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$23.50*
No. 2 Heavy Melt. Steel	*21.50*
No. 1 Busheling	*21.50*
No. 1 Bundles	*23.50*
No. 2 Bundles	*18.50*
Machine Shop Turnings	*15.50-16.00*
Short Shovel Turnings	*17.50*
Mixed Borings, Turnings	15.00-15.50
Bar Crop and Plate	25.50-26.00
Punchings & Plate Scrap	25.50-26.00
Cut Structurals	25.00-26.00
Elec. Furnace Bundles	*24.50*
Heavy Turnings	*23.50*
No. 1 Chemical Borings	29.00
Knuckles and couplers	29.00
Steel car wheels	29.00

Cast Iron Grades

No. 1 Cupola Cast	*30.00*
No. 1 Machinery Cast	36.00-37.00
Charging Box Cast	34.00
Heavy Breakable Cast	34.00
Unstripped Motor Blocks	*25.00*
Clean Auto Cast	36.00-37.00
No. 1 Wheels	37.00
Malleable	38.00-39.00

CINCINNATI

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	23.00
No. 1 Busheling	26.00
No. 1 Bundles	26.00
No. 2 Bundles	20.00
Machine Shop Turnings	13.00
Short Shovel Turnings	16.00
Mixed Borings, Turnings	16.00
Cast Iron Borings	16.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
Charging Box Cast	32.00
Heavy Breakable Cast	32.00
Stove Plate	30.00
Unstripped Motor Blocks	22.00
Brake Shoes	22.00
Clean Auto Cast	38.00
Drop Broken Cast	42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	30.00
R.R. Malleable	*33.00*
Rails, Rerolling	34.00
Rails, Random Lengths	33.00
Rails, 18 in. and under	42.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$21.00-22.00
No. 1 Bundles	23.00-24.00
No. 2 Bundles	20.00-21.00
No. 1 Busheling	23.00-24.00
Machine Shop Turnings	12.00-13.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	14 00-15.00
Cast Iron Borings	16.00-17.00
Punchings & Plate Scrap	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Heavy Breakable Cast	29.00-30.00
Clean Auto Cast	35.00-36.00

BUFFALO

No. 1 Heavy Melt. Steel	$27.50-28.00
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	26.50-27.00
No. 2 Bundles	24.00-24.50
Machine Shop Turnings	18.00-18.50
Mixed Borings, Turnings	19.00-19.50
Cast Iron Borings	19.00-19.50
Short Shovelings	19.50-20.00
Low Phos.	29.00-29.50

Cast Iron Grades

No. 1 Machinery	35.00-36.00
No. 1 Cupola	32.00-33.00
Malleable	31.00-32.00

Railroad Scrap

Rails, 2 ft. and under	38.00-39.00
Scrap rails	35.00-35.50
Specialties	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point

No. 1 Heavy Melt. Steel	$20.25-20.75
No. 2 Heavy Melt. Steel	17.50-18.00
No. 1 Busheling	17.50-18.00
No. 1 Bundles	20.25-20.75
No. 2 Bundles	16.00
Machine Shop Turnings	10.50-11.00
Mixed Borings, Turnings	10.50-11.00
Short Shovel Turnings	10.50-11.00
Punchings & Plate Scrap	19.50-20.00
Cut Structurals	19.50-20.00
Elec. Furnace Bundles	19.50-20.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-27.00
No. 1 Machinery	27.00-28.00
Charging Box Cast	*24.00-24.50*
Heavy Breakable	26.00-27.00
Unstripped Motor Blocks	20.00-21.00
Malleable	34.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$19.00-20.00*
No. 2 Heavy Melt. Steel	*16.00*
No. 1 Bundles	*19.00-20.00*
No. 1 Busheling	*16.00-16.50*
Machine Shop Turnings	*10.00-10.50*
Mixed, Borings, Turnings	*10.00-10.50*
Short Shovel Turnings	*13.00-13.50*
Bar Crops and Plate	*21.00-22.00*
Punchings & Plate Scrap	*21.00-22.00*
Chemical Borings	19.00-19.50

Cast Iron Grades

No. 1 Cupola Cast	*27.50-30.50*
Mixed Cast	*21.00-22.00*
Heavy Breakable Cast	*24.50-25.50*
Stove Plate	*21.50-22.50*
Unstripped Motor Blocks	*17.50-18.50*

CHICAGO

No. 1 Heavy Melt. Steel	$27.00-28.00
No. 2 Heavy Melt. Steel	25.50-26.50
No. 1 Bundles	27.00-28.00
No. 2 Bundles	22.00-23.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings	20.00-21.00
Cast Iron Borings	18.00-19.00
Low Phos.	30.50-31.50
Elec. Furnace Bundles	27.00-28.00
Heavy Turnings	23.00-24.00
Cut Structurals	29.00-30.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Clean Auto Cast	41.50-42.50
No. 1 Wheels	33.00-34.00
Stove Plate	31.00-32.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50-29.50
Malleable	35.00-36.00
Rails, Rerolling	39.00-40.00
Rails, Random Lengths	32.00-33.00
Rails, 2 ft and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	30.00-31.00
Angles, Splice Bars	34.00-35.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	*24.00*
No. 1 Busheling	*19.00*
No. 2 Bundles	22.00
Machine Shop Turnings	*22.50*
Mixed Borings, Turnings	*17.00*
Short Shovel Turnings	*23.00*
Cast Iron Borings	*19.00*
Bar Crops and Plate	*28.00*
Cut Structurals	*28.00*

Cast Iron Grades

No. 1 Cupola Cast	*35.00*
Stove Plate	*30.00*
No. 1 Wheels	*nominal*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*27.00*
R.R. Malleable	nominal
Rails, Rerolling	*33.00-35.00*
Rails, 3 ft and under	*nominal*
Angles and Splice Bars	*nominal*

ST. LOUIS

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	24.00-25.00
Machine Shop Turnings	14.00-15.00
Short Shovel Turnings	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
Charging Box Cast	29.00-30.00
Heavy Breakable Cast	28.00-29.00
Brake Shoes	27.00-28.00
Clean Auto Cast	36.00-38.00
Burnt Cast	27.00-28.00

Railroad Scrap

R.R. Malleable	27.00-28.00
Rails, Rerolling	36.00-37.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	36.00-37.00
Uneut Tires	27.00-28.00
Angles, Splice Bars	32.00-33.00
Railroad Specialties	30.00-31.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Wheels	20.00
Rails, Random Lengths	20.00

SEATTLE

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	15.50
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.00
Cut Structurals	27.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-27.50
Heavy Breakable Cast	20.00
Stove Plate	20.00
Unstripped Motor Blocks	20.00
Malleable	20.00
Brake Shoes	18.00
Clean Auto Cast	25.00
No. 1 Wheels	25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	19.00
Railroad Malleable	25.00
Rails, Random Lengths	19.00
Angles and Splice Bars	19.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	9.00
Mixed Borings, Turnings	9.00
Punchings & Plate Scrap	24.00
Elec. Furnace Bundles	25.00

Cast Iron Grades

No. 1 Cupola Cast	*27.00-30.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	32.00

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$24.00
No. 1 Bundles	24.00
Mechanical Bundles	23.00
Mixed Steel Scrap	20.00
Mixed Borings, Turnings	18.00
Rails, Remelting	24.00
Rails, Rerolling	27.00
Busheling	18.00
Bushelings new factory, prep'd	22.00
Bushelings new factory, unprep'd	17.00
Short Steel Turnings	18.00

Cast Iron Grades

Cast	40.00-43.00*

* F.o.b. shipping point.

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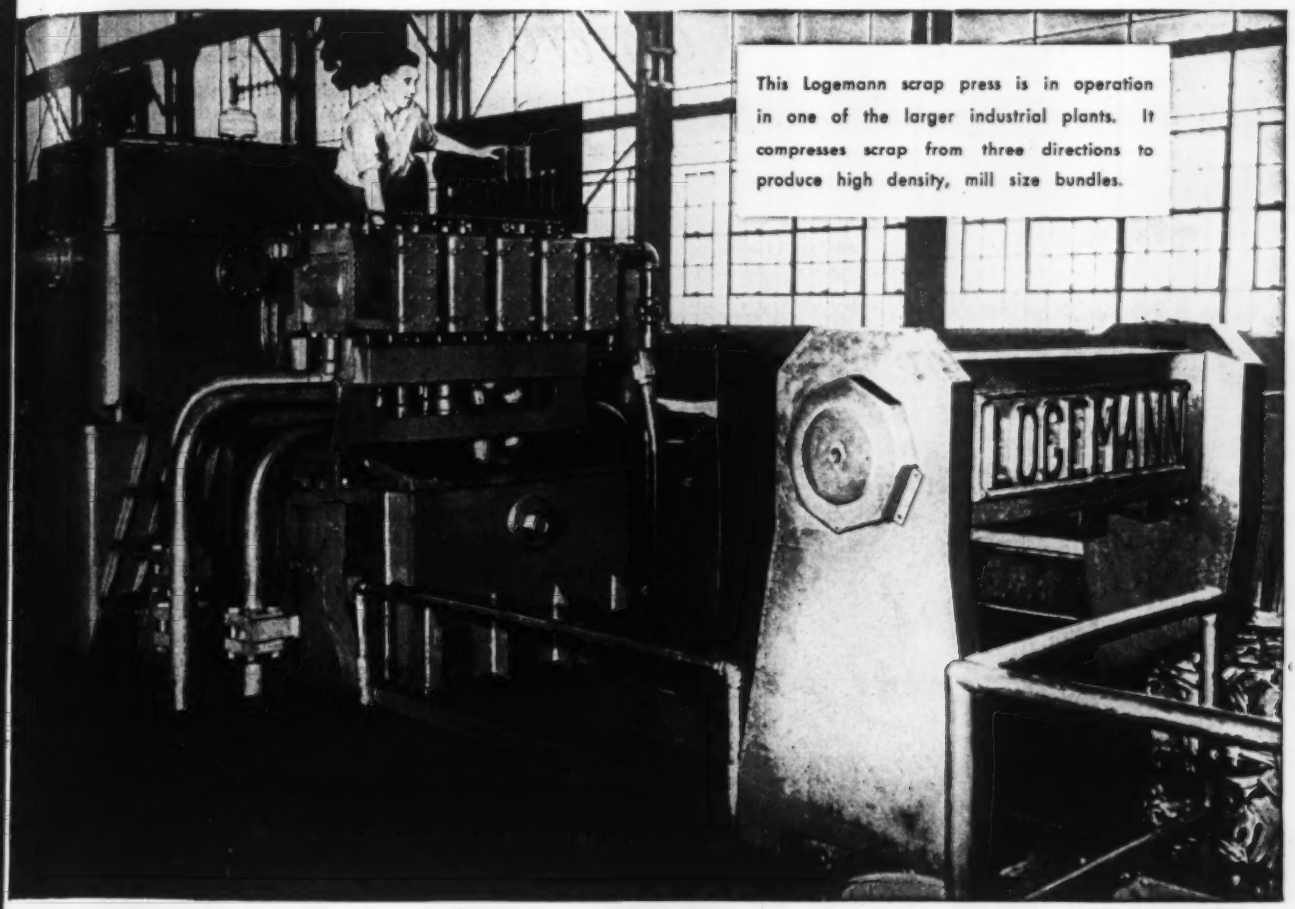

This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

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Triple Compression..
Automatically Controlled

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LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

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Improved quality control of metals at **LOWER COST**

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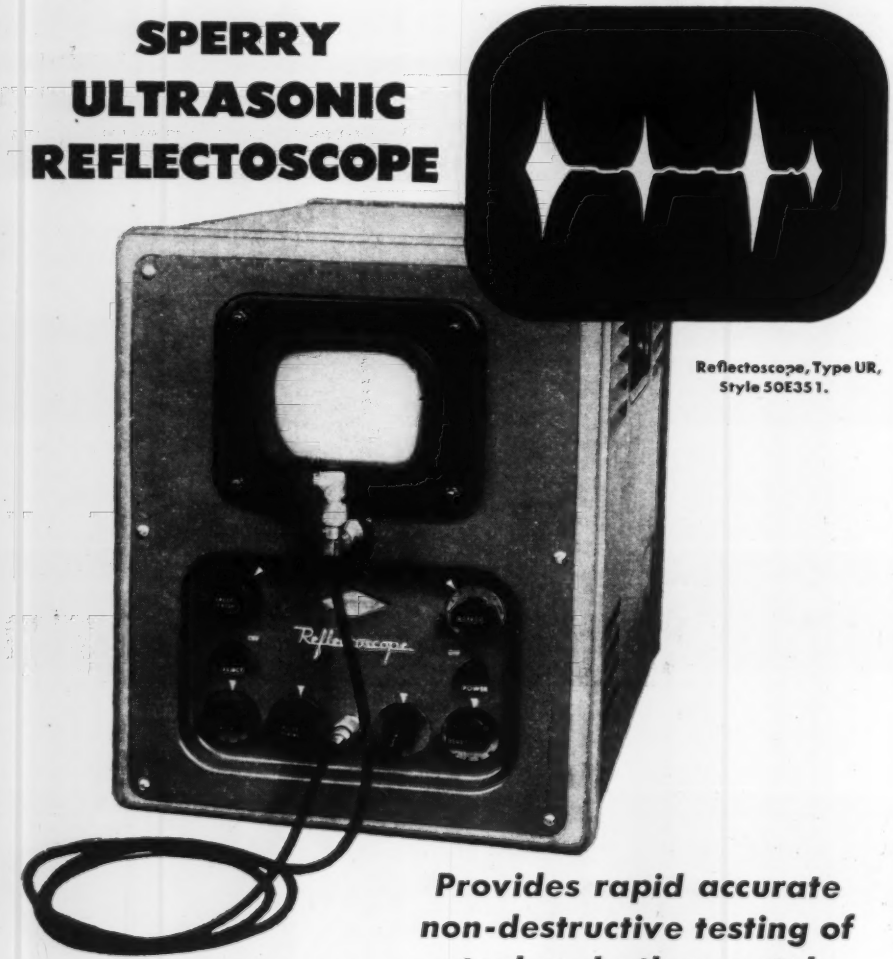

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Provides rapid accurate non-destructive testing of steel and other metals

Metals tested by the Reflectoscope are preferred by users who cannot afford lost machine and man hours. The expense of lost work on faulty metals and possibility of service failures are minimized when potentially harmful defects are located before fabricating or machining.

The cost per test is low because it is instantaneous. The operator touches the quartz-crystal Searching Unit to the surface and immediately "sees" through the metal. Discontinuities are revealed on the Reflectoscope screen and are located accurately. For full details write for new Bulletin 50-105.

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- TESTS PARTS "IN PLACE" —locates fatigue cracks in shafts, rolls, axles and other stressed parts. Operates on 100-130 volt, 60 cycle current.

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SPERRY PRODUCTS, INC.
DANBURY, CONN.

Sperry

SP-159

Sheets, Strip . . .

Sheet and Strip Prices, Page 129 & 130

Pittsburgh—Supply of flat-rolled steel is becoming more acute, notably in galvanized and cold-rolled. The situation closely matches that prevailing throughout early postwar period. Consumers are seeking increase in monthly allotments for scheduling throughout remainder of first half; in some instances, into third quarter. The unusually heavy demand situation is past the stage of replenishing inventories and is interpreted as representing increased production schedules among metalworking concerns. Sellers have experienced heavy pressure for prompt shipments the past two weeks, resulting from customers' fear mill production schedules soon will be sharply curtailed due to the coal strike. No hold-up on shipments to Chrysler Corp. or its suppliers is noted.

Record output of cold-rolled and galvanized sheets and hot-rolled strip was registered at Carnegie-Illinois Steel Corp.'s Irvin Works last month.

Enameling sheet extra cards have been revised with the change previously announced on cold-rolled sheets placing 36-inch wide sheet in lower gage and width extra bracket.

Cleveland—Automotive and appliance demand for sheets and strip is outstanding. No sign has yet appeared of any change in the promising outlook for automobile production and it looks as though the appliance makers will have a good year. Other lines of consumption also are exerting pressure for shipments an the mills are turning away business They now are booked through second quarter.

No relief in the tight supply situation is likely for months. In fact, with production cutbacks threatened because of the coal situation, supply conditions may worsen soon. Little protective ordering is noted, but this is explained by the fact mills haven't anything to sell for early shipment. Consumers have been on quota since the end of the steel strike and even if producers would accept additional business they could not give shipment in time to afford consumers inventory protection. The threat to production is immediate, at most but a couple weeks away in event the coal mining situation doesn't quickly change for the better.

New York—The uncertain coal outlook and its possible effect on steel production is causing sheet buyers much concern. In most instances they are not receiving enough tonnage to meet requirements and curtailment in output would hit them particularly hard. Most consumers have limited stocks. Leading sellers are booked up for first half on all leading products.

In specialties the situation is somewhat different, especially in stainless sheets which are available for shipment within three to six weeks; stainless bars, in three to four weeks. Of the stainless items, strip is tightest, some producers having nothing to offer under 16 weeks.

Philadelphia—Due perhaps to the particular scarcity of the product, the coal crisis has aroused more concern among buyers of sheets

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than of any other finished steel item. Most sheet consumers have relatively little inventory on hand and most of them would like more tonnage than they have under contract. Hence, any development that threatens even existing supply is proving highly disturbing. Another two weeks of idleness at the mines might seriously retard the production and movement of sheets. Deliveries on major grades are far extended and there is talk of a revival of government requirements for grain storage bins.

Boston — Demand for flat-rolled steel products extends well through second quarter on a broad range of products for end-use, from cut nails to electric motors. In some instances, consumers appear covered sufficiently for the time being on paper, but are increasingly concerned as to firm schedules and deliveries. Stainless is competitive, one of the few grades where this situation exists, and some mills are meeting delivered prices by freight absorption.

Chicago—Mill men wish they knew how much of current ordering is traceable to fear operations will be curtailed by the coal strike. Pressure for shipment of first quarter allocations has been constantly growing and last week had fully attained the proportions of last year's tightest period. Next quarter's monthly quotas as announced by one mill show little change from this quarter's and mills are not hopeful of being able to gain much ground on their arrearages. Increasingly more order changing is being noticed because of the extra revisions although mills doubt that bulk of changes has yet appeared.

Cincinnati—Demand for sheets continues high, as reflected in pressure for deliveries and by requests for second quarter tonnage. Allocations for next quarter are being established. Needs for cold-rolled and galvanized outstrip production.

Birmingham — Pressure for sheets continues. Order books are full for three months or more. Allocation of tonnage will remain in effect so long as demand stays ahead of supply.

Wire . . .

Wire Prices, Page 132

Chicago—Wire users are increasing their orders and are applying more pressure on mills for prompt delivery of promised tonnages. Most noticeable at present is interest in merchant products, although manufacturing wire items are also in big demand. Warehouse inventories are low and unbalanced and open weather has spurred demand for farm wire products, bale ties the exception.

Birmingham—Wire volume, which tapered off somewhat a few weeks ago, has assumed substantial proportions. This is due to recurring and extended warm weather, and to needs from the Florida citrus belt. A general surge in requirements for manufacturers' wire is noted.

Los Angeles — Sheets remain on quota. Allocations are on 60-90 day basis. Producers of cold-rolled strip are booked through April. Strong demand for this product is coming from manufacturers of domestic heating equipment.

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IF you want stainless steel having

★ More area per ton

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★ Equivalent area weighing 3% to 8% less

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★ Unusually high physical properties

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Company.....

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Developments for Reducing Cost of Manufacturing and Servicing Chilled Iron Rolls

ROUGHING and FINISHING TOOLS for Plunge Feed Lathes

STYLE RRT

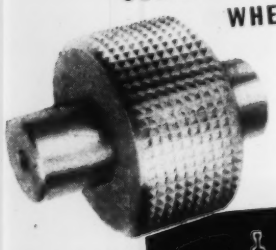
STYLE RT

Style RRT (above) has replaceable solid Kennametal cylinders that can be turned on their axis to provide a multiplicity of cutting edges; Style RT (right) has a solid Kennametal blade that provides four successively available cutting edges. Standard widths, both tools 4", 6", 8", 10"

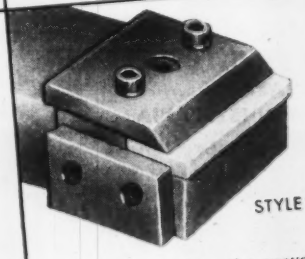
These rugged, durable Kennametal tools cut machining time in half, on chilled cast iron rolls. Style RRT slices through scale easier, permits faster speeds and huskier feeds, trues up a roll quickly. Style RT gives superior finish that requires little or no grinding. Exclusive features include: (1) Kennametal cutting edges that stay sharp up to 100 times as long as steel; (2) Exceptional strength that stands gaff of crashing through scale, chill balls, and burned spots; (3) Simplified maintenance—resharpening simply requires squaring off the cutting edges. Ask our field engineer to demonstrate.

The ground-in knurls of this solid Kennametal wheel keep their shape far longer than those on steel wheels—performance reports indicate as much as 100 times the service before regrinding is necessary. Made on order to customer's specifications.

SOLID KNURLING WHEEL



CLAMPED-IN BLADE TOOL for Longitudinal Feed Lathes



STYLE LRT

This tool employs the proved Kennametal mechanically-held principle. Its width is 2½", and like the Style RT tool shown above its blade has four cutting edges that can be used before any sharpening is required. Then the cutting edges are squared off, and the blade can be advanced after each sharpening.

KENNAMETAL Inc.
LATROBE, PA.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

Steel Bars . . .

Bar Prices, Page 129

Philadelphia—While demand for hot carbon bars is fair and reasonably diversified, volume reflects continued low operations in district forge shops and dearth of buying in the coal mining regions. One eastern producer is practically booked up through March, but consumers have little difficulty in getting shipments against new orders within four to five weeks from other sources. Cold-drawn carbon bars can be had for early shipment, although most eastern sellers are fairly busy.

New York—Hot carbon rounds ⅜ inch and smaller, and the smaller sizes of flats are in fairly tight supply. Some producers are booked into May. On the larger sizes, deliveries are obtainable within four to six weeks, and overall, the situation appears in fair balance. Cold-drawn carbon bars can be had for fairly early shipment, some mills offering two and three weeks. Some, in fact, can make deliveries out of stock on certain standard sizes. Sellers with light inventories on hand, however, are offering late March deliveries.

Pittsburgh—No hold-up of shipment on merchant carbon or alloy bars resulting from the Chrysler strike has yet developed. Automotive industry continues the major consuming group. Good demand also is noted from farm implement and electrical appliance interests. Some cold finishers have increased production schedules, attributed in part to improved demand resulting from customers' fears that output will be curtailed soon because of the coal strike. Similarly, consumers of hot-rolled carbon and alloy bars are attempting to get earliest possible deliveries from the mills.

Cleveland—Pressure for merchant bars is somewhat stronger, consumers exhibiting increased interest in protective coverage. With production curtailment threatened because of the coal strike some users are specifying more actively against contracts. Some new buying also is reported and in some sizes the mills are heavily booked for the next six to eight weeks. Hot-rolled carbon bars are in much tighter supply position than cold-finished or alloy bars.

Los Angeles—Bar demand has lightened substantially. Mills are increasing the frequency and reducing the tonnage of their rolling schedules to meet the competition of small producers.

Semifinished Steel . . .

Semifinished Prices, Page 129

Cleveland—Some conversion ingot buying is being done by automotive and appliances makers but demand is anything but spirited. It is estimated current conversion business totals no more than 5 per cent of the volume done in 1948-49. Conversion ingot is reported to have been moved in this district lately at $60 to $62 per ton against $50 in the standard market. At other points, however, up to $80 per ton has been reported done.

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 129

Cleveland—Open weather in this area is encouraging some building activity that normally would be delayed until spring. Reinforcing bar sellers report a fair volume of small lot orders. Pickup in business is expected over coming weeks with a large amount of public work shaping up for placement in the spring. Many school projects are expected to come out shortly. Also, several hospital jobs are pending.

Los Angeles—Requirements for reinforcing bars have declined, one producer's bookings being off 50 per cent since December. Fabricators report continued good demand for bridges, schools and other public work. Los Angeles county last year led the nation in residential construction, with 7½ per cent of the national total.

Seattle—Lack of immediate delivery orders has caused a sharp cut in local mill operations. Only two of five Bethlehem furnaces are active and Northwest Steel Rolling Mills Inc., has idled its mill.

No large contracts for bars have been booked, although fair demand for small tonnages is noted.

Several sizable projects are in prospect, including 1250 tons reinforcing for the Lookout Point dam, Oregon, bids about Apr. 20; about 1000 tons for a Portland apartment house, general contracts placed; 200 tons for an Oregon railroad relocation job; unstated tonnages for Alaska Military installations.

Structural Shapes . . .

Structural Shapes Prices, Page 129

Boston—Elevated arteriel highway, Boston, for which first estimates are out, will take an estimated 50,000 tons of fabricated structural steel, requirements including new bridge over Charles river. By all odds this will be the largest structural steel project in New England this year. Remaining to be placed are about 4000 tons, last contracts involving bridge, circumferential highway, Route 128, Massachusetts, final estimates closing Feb 28. Bridge needs, supplemented by more school building, hospital work, more than balance decline in private building. Competition is keeping prices down; instead of reflecting advances in plain material, quotations for fabricated and erected steel are at postwar lows.

Philadelphia — Sharp competition among structural fabricators is reflected in fabricated material prices and the manner in which some shops are going out of their usual channels to develop business. Some of the larger fabricators are going after smaller projects and some of the smaller shops are competing for larger work than usual. Promises on shape deliveries range generally from four to six weeks on standard sections.

Birmingham—Structural shops are maintaining production at a high level. Inquiries are coming in for projected construction of a major nature which is expected to materialize by early spring.

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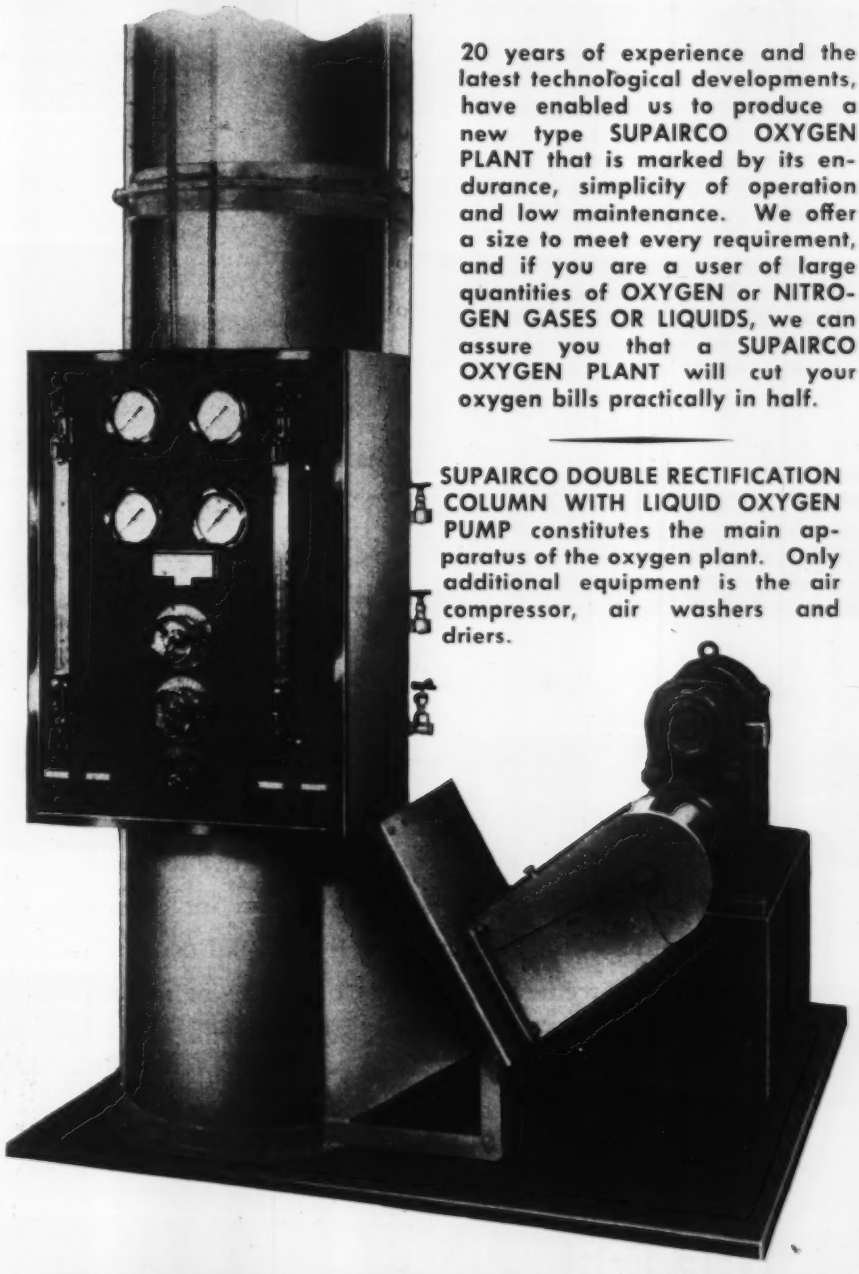

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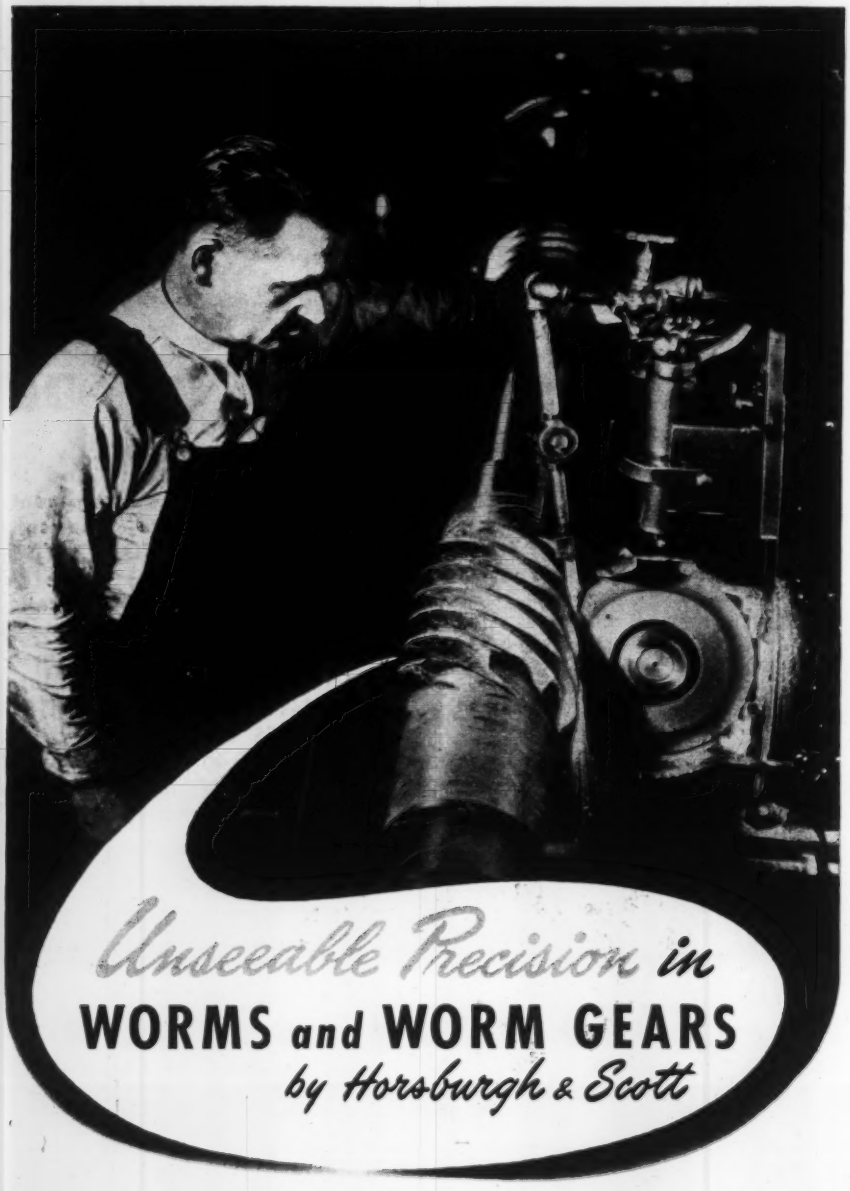

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Plates . . .

Plate Prices, Page 129

Chicago—A possibility that wide plates will be too tight to permit freight car builders to book the tonnage they will require is suggested by one mill man. Surge of activity by this outlet in recent weeks may be stymied by the fact plate mills are operating at top capacity on pipe line tonnage and orders taken now are generally for June delivery. Several Midwest heavy equipment builders' production is restricted by lack of steel and power shovels, for example, which normally would be sold on an immediate or at most a 30-day delivery promise. These are not available until midsummer.

New York—Plate specifications are light. Most eastern mills offer early deliveries. At least two can ship in two weeks if necessary. Gas and oil specifications are a shade heavier, but not sufficiently so to have any important bearing on eastern mill bookings. The railroad outlook is also a trifle more encouraging. Most sellers believe much more business than is now in sight will have to develop before it will have marked bearing on their operations.

Boston—Although some plate deliveries are more extended due to a bulge in railway carbuilding orders last month, shipments are possible in three weeks from eastern Pennsylvania mills. Buying in this area is slow. Light gages and prompt delivery mark demand. Shipbuilding consumption is steady and slight increase in small tank inquiry is developing.

Philadelphia—District plate mills are having little success in building backlogs. Most can make shipments within three weeks. Prospects in the railroad field leave much to be desired.

Birmingham—Plate demand is considerably ahead of output and there is some waiting, although not in alarming degree. Tightening up is due largely to receipt this year of sizable orders at the Bessemer plant of Pullman-Standard Car Mfg. Co. which has been practically down for some time.

Seattle—Plate fabricators' backlogs have disappeared and little new work has come out for bids. One local plant reports no backlog for the first time in 15 years.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 133

Cleveland—Oven coke prices are up $1 per net ton in line with advances effected at several other points. The Painesville, O., producer now quotes $21.90 ovens. The increase reflects stronger demand from the foundries and the fact coke producers of late have been paying premium prices for some of the coal they have been taking in. Some anticipatory buying is reported as a result of the coal strike.

Pittsburgh—Little increase in pressure for prompt oven foundry coke deliveries is noted despite dwindling coal stocks. Depressed foundry activity is major factor in this connection. Beehive operations were suspended last week.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 133

Detroit—Price advance of 5 to 8 per cent in all types of machine screws, wood screws and sheet metal screws, slotted and special head types, became effective Feb. 6. Principal manufacturers explain the increase as due to higher steel costs. Where certain types of surface finishing treatments are required, involving increased costs, price boosts run to 8 to 9 per cent.

While the effective date generally was given as Feb. 6, in some cases large volume users are being covered at old prices until shipments made Mar. 1 and after, to permit necessary clerical work, adjustment of cost sheets, invoices, etc.

Pittsburgh—Some improvement in demand is noted, attributed partly to customers' fear production will be curtailed because of pending restrictions on use of power in Pittsburgh due to the coal strike. Most producers are operating 5 days per week although all facilities are not operating full time. Demand for pole line hardware is more active than that for nuts, bolts and rivets. Most standard sizes are available from stock.

Pig Iron . . .

Pig Iron Prices, Page 128

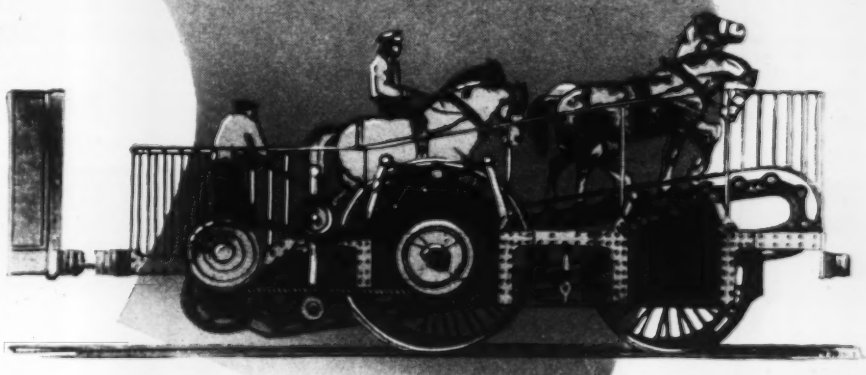
Pittsburgh—Northern pig iron interests are not expected to take any action on prices until they have had time to evaluate costs under expanded pension and insurance programs, effect of higher iron ore costs, and other market factors this spring. Advance of $3 per ton, recently put into effect by Birmingham district producers, about restores reductions initiated last year which were not followed by northern interests. Scarcity of coal has not prompted major integrated mills to substantially increase scrap charge in relation to hot metal in open-hearth operations. Increased consumption of scrap at this time might force a sharp upward trend in scrap quotations. Carnegie-Illinois Steel Corp. established a new pig iron production record at its Youngstown, O., works and also at the Carrie furnaces in Pittsburgh district.

New York—Menacing coal situation is stimulating pig iron and coke buying by foundries in this district. Most had been ordering only hand-to-mouth because of the availability of quick shipments. Pig iron producers say no immediate stringency in iron threatens as they have fair stocks. Furnaces regularly supplying iron in this district do not contemplate curtailing production in the immediate future. Coke sellers are less optimistic, but say there is little possibility of immediate shortage.

Substantial quantities of foreign iron are being offered here at $40 to $42 a ton c.i.f., mostly from Holland, Belgium and Austria. These offerings are receiving little attention.

Philadelphia—Pig iron consumers are showing increasing concern over supplies as a result of the coal crisis. Up to now no important curtailments have been made in eastern pig iron production. Some consumers are en-

Iron Horsepower



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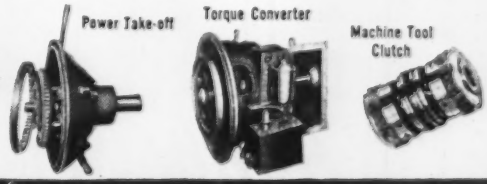

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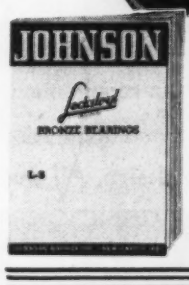

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deavoring to obtain early shipment of all commitments. Merchant sellers have fair stocks and should be able to maintain regular shipments.

Buffalo—Demand for merchant pig iron exceeded output last week as the coal situation lowered production to 81 per cent of capacity. Sellers, however, reported the flurry was not panicky as foundries have a coke problem to contend with also.

Cleveland—Merchant pig iron market in this district is more active. New buying is somewhat improved and the foundries have stepped up releases on contracts noticeably. Some of this improved demand is due to apprehension of iron shortage with blast furnace operations beginning to shrink because of coal shortage. Republic Steel Corp. took off two district stacks last week.

Chicago—Second blast furnace to be banked by Inland Steel because of the coal situation went down Feb. 10. Curtailment of hot metal supply will affect the company's steel production immediately. Five of the company's eight units are still in operation. Number of furnaces active in the district is 34, eight being down.

Cincinnati—Modest flurry of ordering in pig iron developed with the intensification of the coal shortage. Trend in the melt is slightly upward.

Birmingham — Coal shortage is hitting pig iron production here rather hard. Sloss-Sheffield Steel & Iron Co. has cut back its schedule between 40 and 50 per cent, result of a "substantial" reduction in coking operations. Tennessee Coal, Iron & Railroad Co. ordered a 40 per cent reduction in coking last week. The district anticipates an inevitable slowing down in the steel ingot rate.

Sloss-Sheffield Steel & Iron Co. and Woodward Iron Co. announced a price increase of $3 a ton on pig iron, effective Feb. 4 and Feb. 6, respectively. A similar increase was made by Republic Steel Corp. on Jan. 12.

Los Angeles—Pig iron supplies are larger than at any time in months, particularly foundry grades. Foundry activity continues in the doldrums, the general level of operations being estimated at 30 to 40 per cent of capacity. Foreign iron is offered here, with shipments enroute from Belgium.

Seattle — Foundry operations are slow, many plants being idle during the severe winter weather. Materials are in good supply. One local plant has purchased about 100 tons of foreign pig iron, reportedly British, at $47.38, fob cars here, $7 under the level at which domestic pig is offered. The imported material is of good quality.

Iron Ore . . .

Iron Ore Prices, Page 134

Philadelphia—Although lake ores were recently reduced 50 cents a ton, the eastern local ore situation remains unchanged. This may be due in part to the fact that the movement of lake ore at the new prices will not start until spring and also to the fact that eastern ores are usually more affected by changes in the price of imported ores. At present, quotations on foreign ores are easier but unchanged.

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Scrap . . .

Scrap Prices, Page 136

Philadelphia — Prices on major grades of open-hearth scrap are slightly stronger. No. 1 heavy melting steel and No. 1 bundles are now holding firmly at $23.50, delivered, on the basis of some recent buying; No. 2 heavy melting and No. 1 busheling at $21.50. No. 2 bundles are a shade higher at $18.50-$19.

Turnings are easier. In charging box and heavy breakable cast there has been an appreciable drop to around $31.50-$32. Machine shop turnings are lower at $15.50-$16; short shovel turning, $17.50; heavy turnings, $23.50. Mixed borings and turnings are unchanged at $15-$15.50. Electric furnace bundles also are a shade easier at $24.50. Unstripped motor blocks are easier at $25.

The leading Trenton, N. J., consumer of low phos scrap has lifted its ban on scrap shipments after a curtailment of a couple of weeks or so for furnace repairs.

New York—Brokers' buying prices are featured by a reduction in charging box and heavy breakable cast to $24-$24.50. Offerings on all other grades are unchanged.

Pittsburgh — Dealer open-hearth scrap purchases are at a low ebb, due to uncertainties as to future mill production schedules. Scrap supplies are adequate but quotations undoubtedly would continue their recent upturn if a significant increase in scrap consumption in relation to hot metal in open-hearth operations occurred. Some mills recently entered the market for large tonnages of short turnings to help offset dwindling coke and coal supplies. Similarly, increase in movement of cast scrap to foundries is noted with the price on mixed yard cupola higher. Railroad heavy melting also is up 50 cents on latest awards.

Boston—Slight improvement in demand has firmed No. 1 heavy melting and No. 1 bundles, at $19.50-$20, shipping point. But No. 2 grade is slow to follow. One leading Pennsylvania consumer has lowered bids on the latter $1. Yards in this area are well stocked with No. 2 steel scrap. Consumers have further tightened specifications on bundles. Operators are reducing the price for light scrap at yards. Cast scrap is slow with prices on the weak side.

Buffalo — Buying interest has reached low ebb in scrap with the coal shortage threatening ingot operations curtailment. Attention is focused on mills' efforts to tighten up on inspection. Tin cans in bundles is the main target.

Cleveland—Steel mills have not canceled any orders for scrap and are receiving large tonnages of industrial and railroad material. Some brokers believe the mills may issue orders for postponement of shipments if curtailment in operations continues to accelerate. In that case, yards would resume stockpiling, placing the scrap market again in the "ample" supply position. Foundries are buying scattered small tonnages. Prices generally are unchanged with the exception of No. 1

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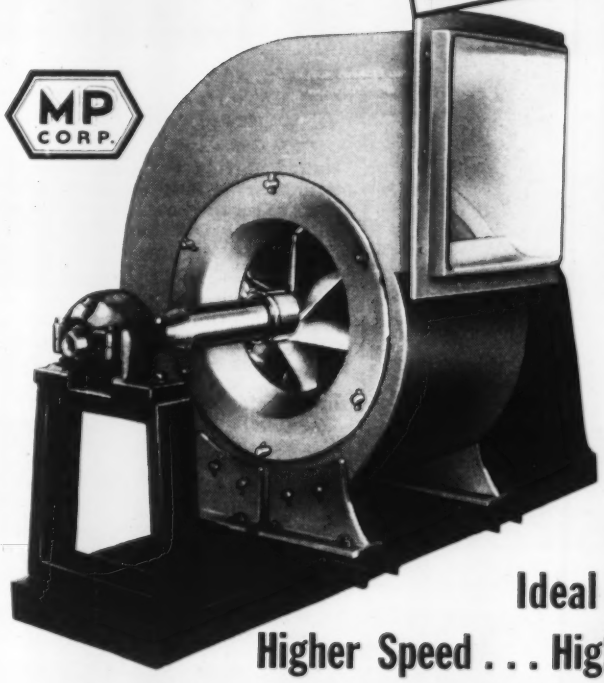

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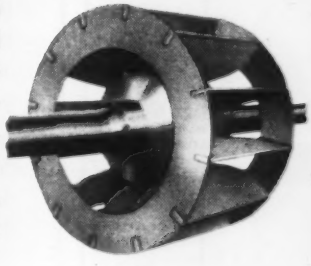

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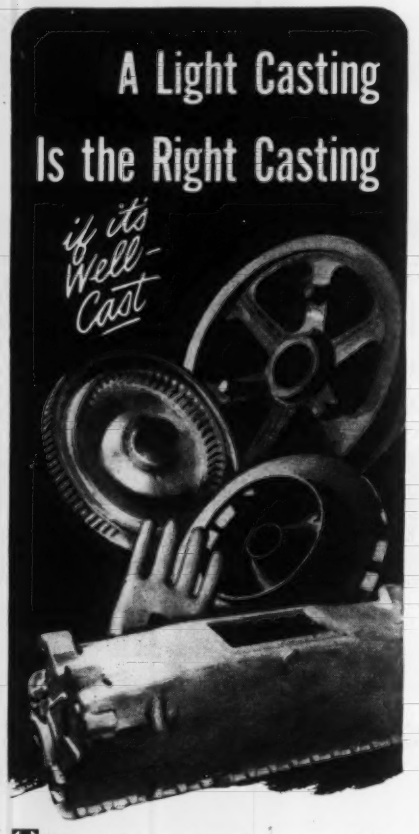

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heavy melting railroad scrap which is 50 cents higher at $32.50 to $33.

Detroit—Little change is noted in the market, attitude of most interests being to mark time until the coal dispute is settled. In the absence of any marked mill sentiments one way or another, prices are steady. Scrap tonnage from Ford and General Motors plants this month should be of record proportions.

Chicago—Steel mill buying has attained normal level and with one mill which for several months has avoided dealer scrap now buying from this source tenor of the market is strong. Price structure is well stabilized at the $28 figure for No. 1 heavy melting.

St. Louis—The coal strike and prospect that scrap consumption may jump to offset pig iron shortages have given a strong undertone to the scrap market. Quotations have held unchanged for two weeks. The district's largest consumer has offered to place the first substantial order for No. 2 heavy melting steel in many weeks at $25, delivered. This is $3 under the last purchase.

Los Angeles—The sails of the scrap industry here are flapping idly. Prices are holding, but mill demand is slow and selective; undertone is soft. The top range of No. 1 cupola cast has risen $1 to $30 a gross ton.

Seattle—Cast iron scrap market is dormant. Recent sales in small lots have been made within the range of $25-$27.50. There is little movement of steel scrap. The market is firm at $18 for No. 1 and No. 2 heavy melting.

Warehouse . . .

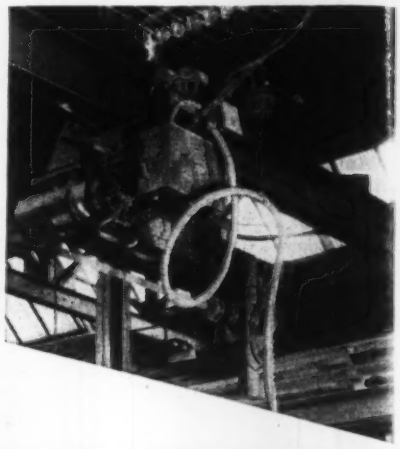
Warehouse Prices, Page 134

Pittsburgh—Extended mill deliveries and prospect of curtailment in production due to coal shortage prompts increasing reliance on steel distributors. Warehouse prices are uniform on all products with exception of galvanized sheets on which one distributor quotes a premium due to fact his supply source charges a premium price and because of freight involved.

Philadelphia—Leading distributors are revising their quantity extras on finished bars. Under the new schedule, base is now 2000 pounds and over, with 1000 to 1999 pounds taking an extra of 25 cents, 500 to 999 pounds, $1, 300 to 499 pounds, $1.75, and under 300 pounds $2.75. This represents an increase of about 25 cents. Meanwhile, the base prices here continue at 6.46c city and 6.21c country.

Cleveland — Local warehouses are booking somewhat larger volume business. Demand is especially pressing in the light, flat-rolled products. For the most part distributors' stocks are in good balance with the exception of sheets and strip. These latter items are moving from warehouse floor into consumption almost as quickly as received from the mills.

Chicago—Consumers are applying more pressure on warehouses for their needs, part of which is caused by fear mill operations will soon suffer for lack of coal. Another factor for improvement is the number of former mill customers who



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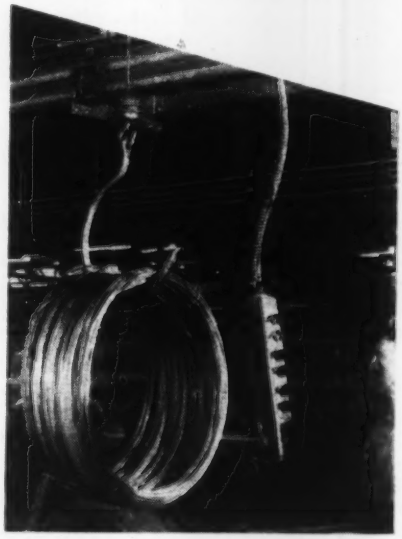

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now can purchase more economically from warehouses under the new schedules or can eliminate inventory overhead.

Cincinnati—Distributors are unable to meet demand for sheets. Other steel items are in good supply. Inventories, except for sheets, are better balanced and larger than in many months. Only one warehouse suspended deliveries—for three days—because of the Ohio river flood.

Birmingham — Warehouse demand continues strong. Stocks generally have improved, although some disappointment is expressed over inability to get certain badly needed items, including sheets.

Seattle—Warehouse volume is below normal due to severe winter weather affecting construction. Inactivity in logging and sawmill areas reduces buying.

Refractories . . .

Refractories Prices, Page 134

East Liverpool, O. — The Globe Brick Co. has announced new prices on ladle brick, effective Feb. 15 as follows: Wire cut 2½ in. brick $58 per 1000; dry press 2½ in. brick $60 per 1000. Prices are f.o.b. the company's shipping point, Chester, W. Va.

Rails, Cars . . .

Track Material Prices, Page 132.

Chicago — Fact that nationwide more freight cars have already been ordered in 1950 than in all of 1949 has car builders hopeful that reopening of some closed facilities will be possible. One such is Pullman-Standard Car Mfg. Co. whose Michigan City, Ind., plant, which normally employs 2000 but recently has been operating with 400, will resume certain of its operations late in March.

New York—Domestic freight car awards in January involved 9386 units, reports American Railway Car Institute. This compares with 6248 cars placed during the entire year of 1949. Order backlogs as of Feb. 1 totaled 19,026 compared with 12,036 Jan. 1 and 96,461 Feb. 1, 1949.

Domestic freight car deliveries last month totaled 2395, against 2330 in December and 8913 in January 1949.

Seattle — Bethlehem Pacific Coast Steel Corp. has booked 2000 tons of tie plates, 100 tons of track spikes and 50 tons of track bolts for the Great Northern Railway.

Canada . . .

Toronto, Ont.—New business is active in the Canadian steel markets. There are no indications of any sharp decline through first half. Mills are booked through first quarter. They have not opened books for second quarter.

Bookings are particularly heavy on flat-rolled products, carbon steel bars and cold-rolled steel. Galvanized sheets are about the only scarce item on the list. Demand for steel plate has increased.

The 1949 steel strike in the United States, together with Canadian dollar devaluation and rising prices in the States, have had a tendency to throw a greater volume of buying to Canadian mills. Domestic consumers prefer home-produced steel when available, but they will continue to import those items not available from Canadian mills.

British steelmakers are making a strong bid for business in Canada and expect to obtain orders totalling between $15 million and $20 million this year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, chemical plant, Ciba States Ltd., Toms River, N. J., to Belmont Iron Works, Eddystone, Pa.

1800 tons, three bridges and underpass, Lookout Point, Oreg., to American Bridge Co., Portland, Oreg., low $431,852, by U. S. Engineer, Portland.

1490 tons, apartment, Grand Street, New York, to Grand Iron Works, that city; G. W. Springsteen, architect.

1130 tons, warehouse, American Sugar Refining Co., Philadelphia, to Bethlehem Steel Co.

600 tons, plant building, Personal Products Inc., Milltown, N. Y., through John W. Ryan Co., to Bethlehem Fabricators Inc., Bethlehem, Pa.

400 tons, high school, Homer, N. Y., through F. D. Rich Co., to Schacht Steel Construction Co. Inc., New York.

320 tons, foundation work, Public Service Gas & Electric Co., Sewaren, N. J., to American Bridge Co., Pittsburgh.

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MARVEL BAND SAW saved these two 4400# castings

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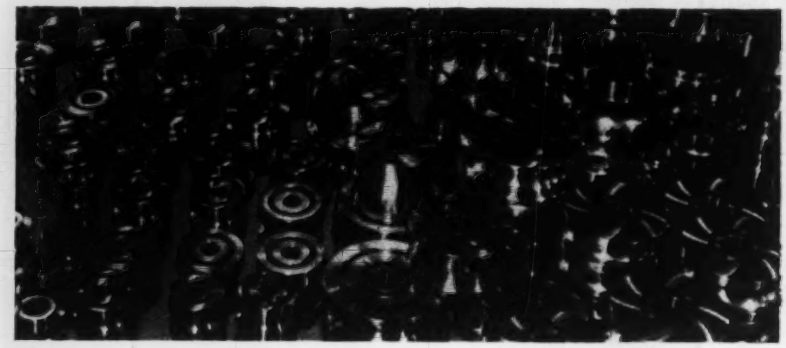

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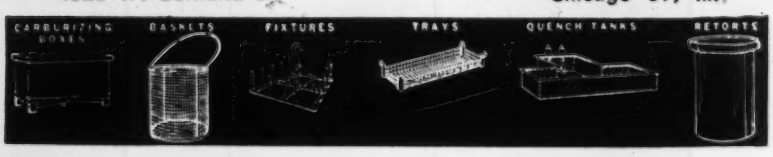

290 tons, bridge, Dempster street on Eden Superhighway, Cook county, Illinois, t American Bridge Co., Pittsburgh.

280 tons, State highway bridge, Newark, N.J to Phoenix Bridge Co., Phoenixville, Pa.

250 tons, bridge, Lincoln avenue on Eden Superhighway, Cook county, Illinois, t American Bridge Co., Pittsburgh.

235 tons, paper mill, Franklin, Va., through Merritt-Chapman & Scott Corp., New York to Richmond Structural Steel Co., Richmond, Va.

230 tons, bridge, Lake street on Edens Superhighway, Cook county, Illinois, to American Bridge Co., Pittsburgh.

220 tons, addition, telephone exchange, Manhattan avenue, New York, to Bethlehem Steel Co.

220 tons, bridge, Church street on Edens Superhighway, Cook county, Illinois, t American Bridge Co., Pittsburgh.

210 tons, steel superstructure, state bridge, Penobscot river, Old Town-Indian Island, Me., to Lackawanna Steel Construction Corp., Buffalo, $73,060.50.

200 tons, two state bridges, Burlington, Mass., to Bethlehem Steel Co.; Lane Construction Co., Meriden, Conn., general contractor.

175 tons, store building, McCrory Stores Co., Canton, O., to Canton Structural Steel Co., that city.

160 tons, plant building, Woodall Industries, Mineola, N. Y., through Brown & Matthews, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

115 tons, galvanized transmission towers, Public Service Gas & Electric Co., Kenilworth, N. J., to Bethlehem Steel Co.

105 tons, bridge repairs, Delaware, Lackawanna & Western, to Anthracite Bridge Co., Scranton, Pa.

STRUCTURAL STEEL PENDING

6225 tons, state bridge project, Cumberland and Dauphin counties, Pennsylvania; bids Mar. 17.

2700 tons, state bridge, Montgomery county, Pennsylvania; bids Mar. 3.

2050 tons, steel sheet piling, breakwater, harbor improvements, Port Sanilac, Mich.; bids Feb. 27, U. S. Engineer, Detroit district.

1600 tons, state highway bridges, Reading-Wakefield, Mass.; bids Feb. 21, Boston.

1400 tons, state homeopathic hospital, Middletown, N. Y.; bids closed Feb. 8.

650 tons, state highway bridges, Waltham-Weston, Mass.; bids Feb. 28, Boston.

400 tons, Lookout Point dam, Oregon, spillway and miscellaneous; bids to U. S. Engineer, Portland, about Apr. 20.

400 tons, Mercy Hospital addition, Johnstown, Pa.; bids Feb. 17.

160 tons, Homewood Church Home, near Hagerstown, Md.; O. H. Hostetter Builders Inc., Hanover, Pa., awarded general contract.

150 tons, addition, St. Mary's Cathedral, Ogdensburg, N. Y.; bids Feb. 25.

125 tons, Bonneville dam swing bridge, including 35 tons grill deck; bids to U. S. Engineer, Portland, Oreg., Feb. 21.

125 tons, commercial structure, Great Falls, Mont.; bids in Feb. 6.

100 tons, Myrtle Creek Oregon state bridge; bids in Feb. 6.

100 tons or more, two 350-ton traveling cranes, for McNary dam and navigation locks; Willamette Iron & Steel Co., Portland, Oreg., low $330,556, to U. S. Engineer, Portland.

100 tons, state bridge, Chester county, Pennsylvania; bids Feb. 24.

Unstated, Washington state bridge project, Snake river, replacing structure destroyed by fire; bids to Olympia Feb. 21.

REINFORCING BARS . . .

REINFORCING BARS PLACED

490 tons, tuberculosis hospital, Cleveland, to Paterson Leitch Co., that city.

100 tons, waterworks, Morehead, Minn., to Paper Calmansen.

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REINFORCING BARS PENDING

2800 tons, veterans hospital, Boston; McCloskey & Co., Philadelphia, low on general contract.

3000 tons, veterans hospital, West Haven, Conn.; general contract awarded to Merritt-Chapman Scott Corp., New York.

1800 tons, sewage disposal plant, Milwaukee; bids asked.

1250 tons, Lookout Point dam, Oregon, concrete spillway and miscellaneous; bids to U. S. Engineer, Portland, about Apr. 20.

975 tons, auxiliary outlet sewers, contract 2A, Chicago; bids asked.

240 tons, bridge, Skokie, Ill., Edens superhighway; bids asked.

218 tons, veterinary medicine building, University of Illinois, Urbana, Ill.; bids asked.

200 tons, also 1950 feet culvert pipe, railway and highway relocation project, Lookout Point dam, Oregon; bids to U. S. Engineer, Portland, about Apr. 20.

116 tons, state bridge, Perry county, Pennsylvania; bids Feb. 17.

Unstated, $1 million grain elevator addition to plant of Great Western Malting Co., Vancouver, Wash.; plans in preparation by E. F. Carter, engineer.

Unstated, 12-story Portland Tower apartments, $2¼ million project; contract to L. H. Hoffman and H. R. Ketell, Portland, Oreg.

PLATES . . .

PLATES PLACED

800 tons, tanks, Port Petroleum Corp., Albany and Mechanicsville, N. Y., to Hammond Iron Works, Warren, Pa.

500 tons, tanks and miscellaneous work, municipal disposal plant, Hunts Point, Bronx, New York, through J. Rich Steers, that city, to the Chicago Bridge & Iron Co., Chicago.

100 tons, 100,000-gal. all welded steel tank, for Salem, Oreg., to American Pipe & Construction Co., Portland, low $23,500.

PLATES PENDING

375 tons, fabricated steel penstocks for Lookout Point dam, Oregon; bids to U. S. Engineer, Portland, about Apr. 20.

Unstated tonnage, five steel material barges and two steel oil barges; bids about Mar. 7, U. S. Engineer, Memphis district.

Unstated tonnage, water tank and tower, veterans' hospital, Minneapolis; Pittsburgh-Des Moines Steel Co., Pittsburgh, low, $54,600.

PIPE . . .

CAST IRON PIPE PLACED

250 tons, cast iron pipe, Tacoma system extension, reported to Pacific States Cast Iron Pipe Co., Provo, Utah.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago, Rock Island and Pacific, 1000 all-steel 50-ton box cars, to American Car & Foundry Co., New York.

Western Pacific, one all stainless steel rail Diesel car, to the Budd Co., Philadelphia.

RAILS PLACED

2000 tons, tie plates, also 100 tons track spikes and 50 tons bolts, for Great Northern Railway, to Bethlehem Pacific Coast Steel Corp., Seattle.

LOCOMOTIVES PLACED

New York Central, 137 diesel-electric locomotives, costing $14.5 million and including: 12 road switching units and 38 yard switchers to Electro-Motive Division, General Motors Corp., LaGrange, Ill.; four 2250-hp road passenger "A" units, 8 road switchers, and 49 yard switching diesels, to American Locomotive Co., New York; 16 road switchers, to Lima-Hamilton Corp., Lima, O.; 10 yard switchers, to Fairbanks, Morse & Co., Chicago.

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CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM — A $20,707,900 construction and expansion program for 1950, including an annex to the general office building, has been announced by Alabama Power Co.

ARKANSAS

HURRICANE CREEK, ARK. — Reynolds Metals Co., R. S. Reynolds Jr., president, plans a $1 million expansion of its Hurricane Creek aluminum plant and will build ore unloading facilities at a Gulf port.

CALIFORNIA

EMERYVILLE, CALIF.—Foil Products Corp., a newly organized firm, has leased aluminum foil production facilities from William A. Owsley Co., and shortly will begin production of aluminum foil for gift wrappings, moisture proofing, heat reflecting, refrigerating units and other purposes.

LOS ANGELES—University of California soon will begin construction of a new chemistry-geology building estimated to cost $4,657,000 for building and equipment. Structure was designed by architects Gordon B. Kaufman and Jesse E. Stanton, with principal contract for construction awarded to Haddock Engineering Ltd., Montebello, Calif.

SAN FRANCISCO—Radio Station KROW will let contracts Feb. 15 for construction of a new $200,000 transmitter station on an island in San Francisco bay. Construction will include erection of three steel towers fabricated by Truscon Steel Co.

DELAWARE

DOVER, DEL.—A. Gunthard Co. Inc., steel, iron and gas, has been chartered by the corporation department of the Secretary of State's office here. Corporation Trust Co., 100 W. Tenth St., Wilmington, Del., is serving as principal office.

DOVER, DEL.—Lyon Industries Inc., machines, has filed a charter of incorporation with the corporation department of the Secretary of State's office here. Corporation Trust Co., 100 W. Tenth St., Wilmington, Del., is serving as principal office.

NEW YORK

BROOKLYN, N. Y.—A contract for approximately $3.6 million for construction of Concord Village, a 481-apartment development in Brooklyn's Civic Center, was awarded Sol G. Atlas and Paul Tishman Co. Inc. The buildings were designed by Benjamin Braustein and Alfred H. Ryder, associated architects of Jamaica, Queens, N. Y. Guy B. Panero was mechanical engineer; Weinberger & Weishoff, structural engineer; and Leo Novick, landscape architect; all of New York.

NEW YORK—Negotiations between officials of Triborough Bridge and Tunnel Authority and Madison Square Garden Corp. for construction of a Columbus Circle coliseum are expected to reach an early successful conclusion, according to the authority's annual report for 1949. The report stated that building costs and estimated income are being analyzed and that completion of studies would pave way for an operating agreement with Madison Square Garden. The project will be financed by sale of bonds.

OHIO

CLEVELAND—Scott & Fetzer Co. has announced a $200,000 expansion program to increase both factory and office facilities. Alterations to the plant at 11401 Locust Ave. will cost $75,000.

CLEVELAND—H. Lee Kinsley, president, Kinsley Chemical Co., 4538 W. 130th St., who last year announced plans to build a larger plant at its present location, reports that construction plans have had to be revised upward. The company has decided

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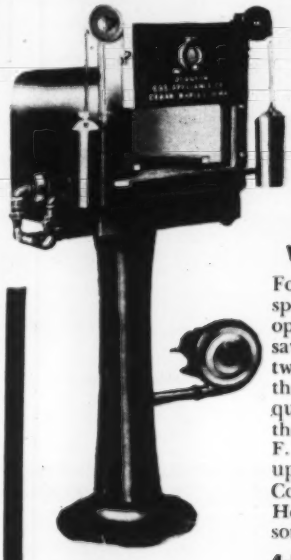

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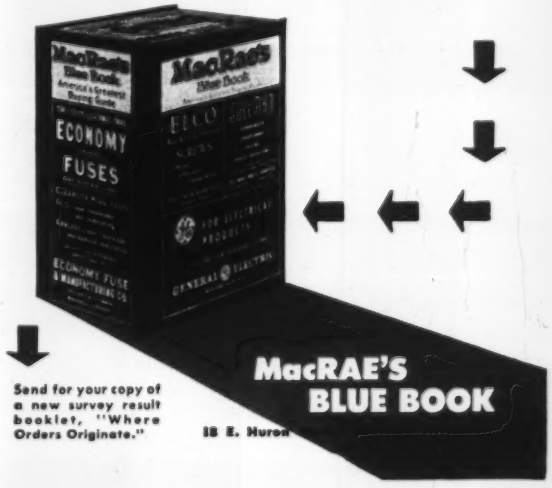

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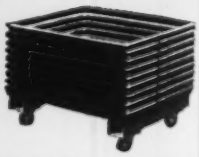

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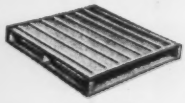

PALLETS

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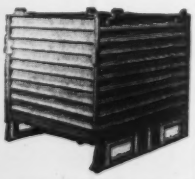

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on a half-million dollar plant, which will more than quadruple present space.

COLUMBUS, O.—Curtiss-Wright Corp. announces a $2 million increase to its current contract with the Air Materiel Command at Wright Field, Dayton, O. The contract calls for work to be done on spare parts for the Curtiss C46 Commando transport. The amended contract is in addition to the $1,250,000 spare parts order released last October.

FREMONT, O.—Zink Corp. plans an expansion project, including an addition to the Jefferson street plant.

LIMA, O.—Standard Oil Co. of Ohio plans to build a $250,000 combination office and laboratory building at its local refinery. Tentative plans call for a 2-story structure on Metcalf street.

SANDUSKY, O.—Bay Billets Inc., manufacturer of aluminum billets for use in producing aluminum extrusions, will be housed in a new building being erected on the old Hinde Brick & Tile Co. site on W. Monroe street near Olds street. Officers of the new corporation are: H. J. Williams, president; R. F. Knapp, vice president; and Wilvert G. Schwer, secretary and treasurer.

ZANESVILLE, O.—Line Material Co. has under way new construction and major alterations costing $210,000 at its transformer plant on Pershing road. Principal new expenditure at the plant centers in a space covering 10,000 sq ft adjacent to the test department. Heavy construction and new equipment being completed there will permit the company to employ an improved process.

OREGON

PORTLAND, OREG.—Stewart Construction Co. will erect a $350,000 assembly plant for Union Pacific Railway, to be taken under long-term lease by Kaiser-Frazer Corp.

PORTLAND, OREG.—City has issued permit to Park Ave. Investment Co. for proposed $3 million Ione Plaza apartments, Tenth & Park avenue. General contract has been awarded Republic Construction Co., Los Angeles. Victor N. Jones & Associates, Seattle, architect.

TEXAS

DALLAS—Lone Star Steel Co. plans cast iron pressure pipe foundry to cost approximately $1 million.

CANADA

VANCOUVER, B. C.—Great Western Malting Co., Manitowoc, Wis., announces plans for construction of a $1 million grain elevator addition to local plant. Plans will be prepared by engineer E. F. Carter within 90 days when bids will be called.

FERROALLOYS

(Continued from Page 133)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

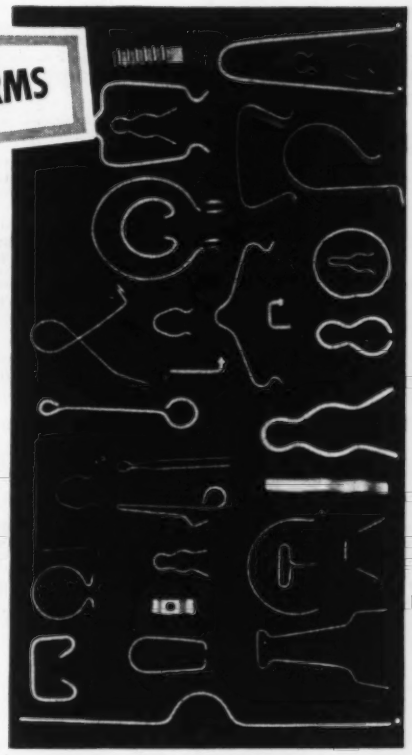
Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. And 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls.

WIRE FORMS



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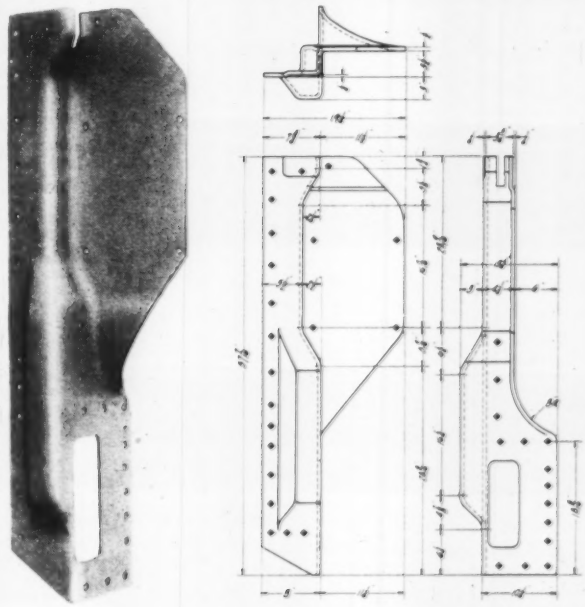

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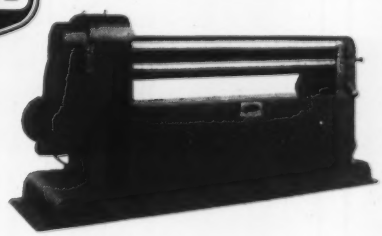
438	36" X 10 GA.	503	36" X 7 GA.	603	36" X 3/8"
444	42" X 11 GA.	504	48" X 8 GA.	604	48" X 5/16"
450	48" X 12 GA.	505	60" X 10 GA.	605	60" X 1/4"
462	60" X 14 GA.	506	72" X 12 GA.	606	72" X 3/16"
474	72" X 16 GA.	508	96" X 16 GA.	608	96" X 10 GA.



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